

Rock Products

with which is incorporated

CEMENT *and* ENGINEERING NEWS

Founded 1896



TWO IMPORTANT MEETINGS!

● May 7-9, the Portland Cement Association holds its annual Spring meeting in Los Angeles, Calif.

★ ★ ★ ★ ★

May 23-25, the National Lime Association holds its annual convention in Chicago, Ill.

★ ★ ★ ★ ★

While the Portland Cement Association, technically, has no connection with Code of Fair Competition for the Cement Industry, it is, nevertheless, the group of portland cement manufacturers, the character of whose activities will decide the future of the industry.

The National Lime Association, on the other hand, has assumed full responsibility for the administration of the Code of Fair Competition for the Lime Industry, as well as for its promotional activities.

These will be the first general meetings of both industries since the advent of their codes. It will be the first opportunity for the rank and file of the two industries "to get the lay of the land," so to speak—to find out what it is all about.

Both industries have done admirable jobs in the writing and establishment of their codes; and since those codes were signed by the President much greater power has been put in the hands of the Code Authorities of the Industries.

If the industries are not now self-governing the fault rests with them and not with NRA or anywhere else. The Code Authorities are the authorized agents of their industries, responsible to them. Likewise, the industries are responsible for the acts of their Code Authorities.

The great fault of popular self-government, as practiced in this country, is the failure of the rank and file to accept their responsibilities; and then to decry the kind of government they claim is set up over them.

The actual, comparative insignificance of the individual in our popular government may excuse his negligence to his own mind, but no producer in a relatively small industry can ease his conscience by the same excuse.

This is his industry; its self-government in the last analysis is his responsibility, not his Code Authority's, the NRA's, the President's, the Democratic Party's, or anyone else's. It is his responsibility to cooperate 100%, or tell his industry why. Every time he oversteps his industry, and its organized agency for self-government, to attempt to use a political "drag," or to appeal to an agency outside his industry, he is destroying the foundations on which his industry must build its future.

The derision and failure which will meet industries incompetent of self-government will, in the future, be a far greater factor in the success or failure of an individual's business, than it is now or ever has been.

Therefore, the May meetings of these two industries are important historic occasions—we shall sometime date them as the first year A.C. (after the Code). While, as always, we hope they will be marked by good-fellowship, we trust they will also be distinguished by a high sense of civic conscience.

—The Editor ●



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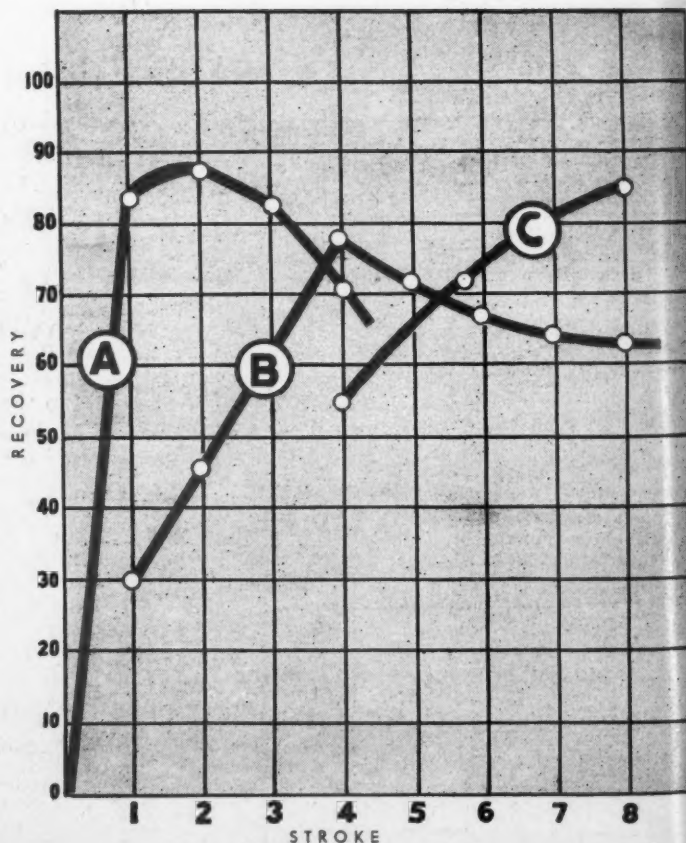
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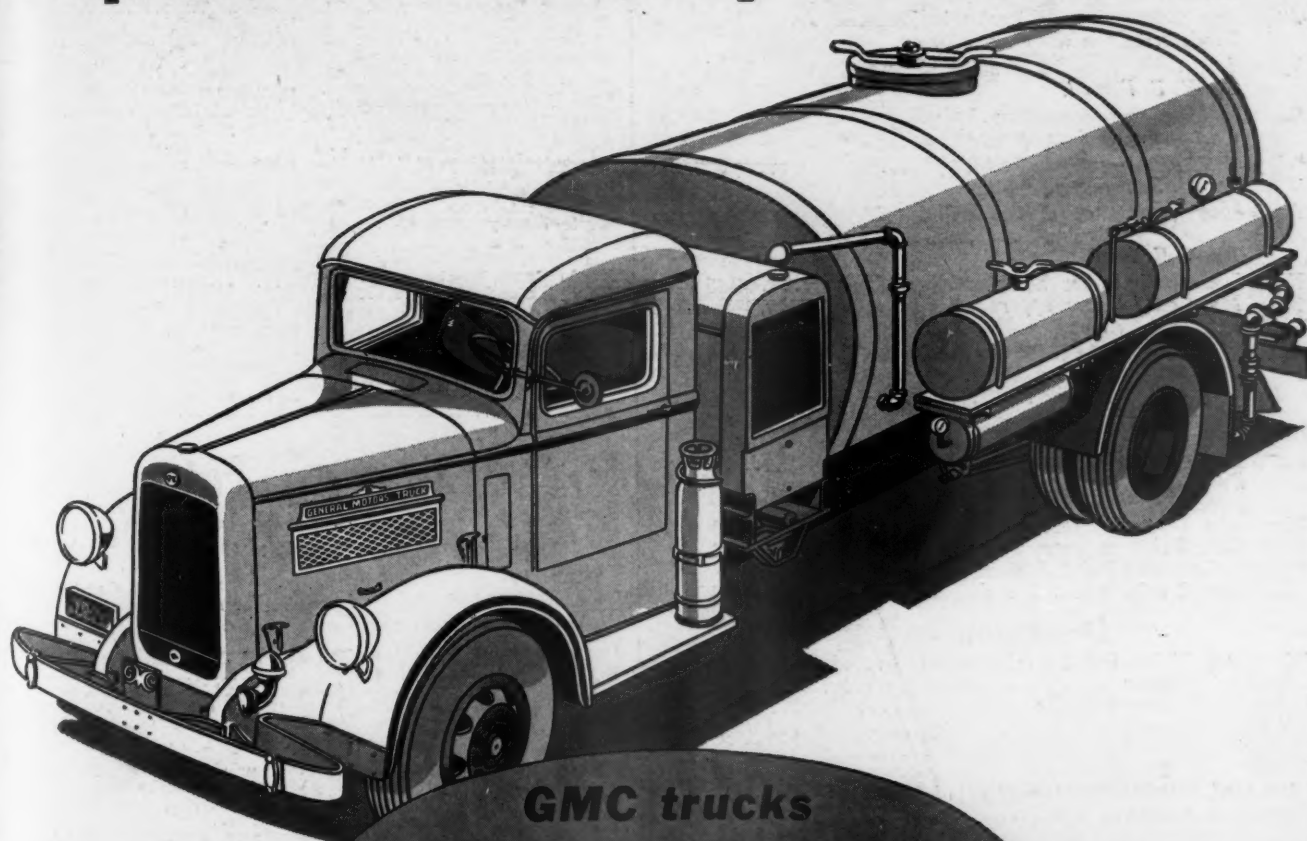
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May, 1934

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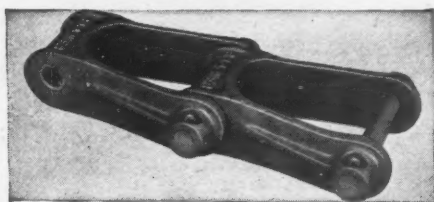
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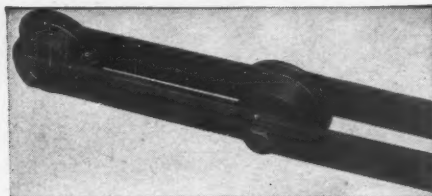
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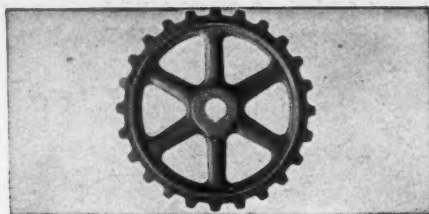


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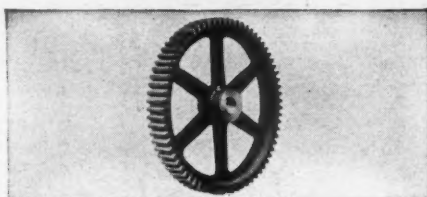


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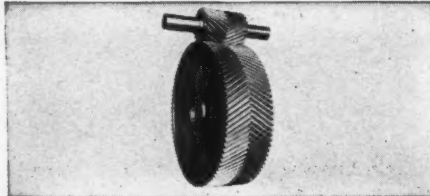
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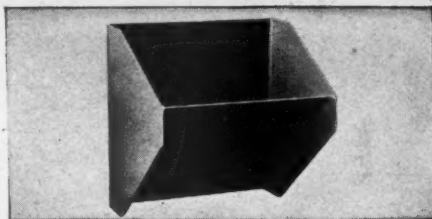


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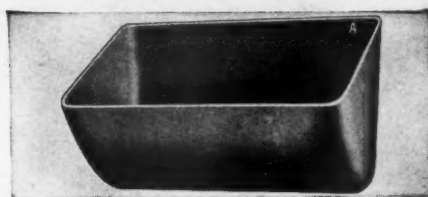


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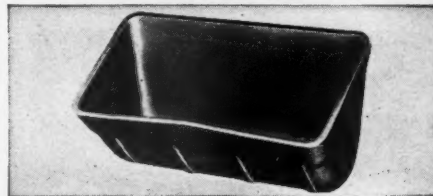
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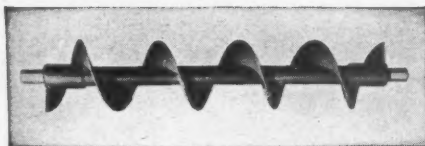


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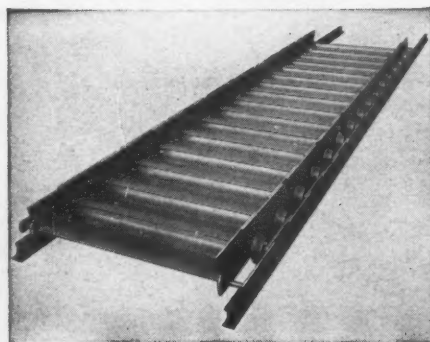


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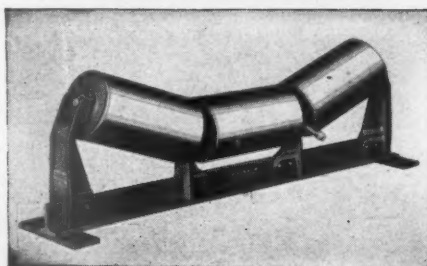
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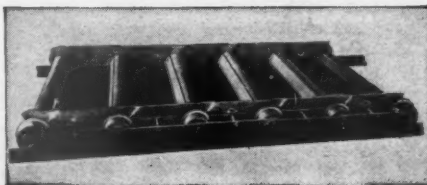
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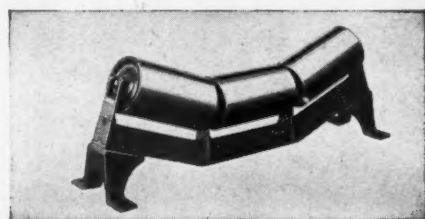
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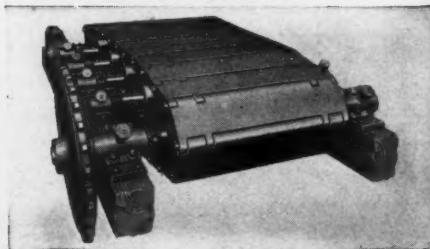
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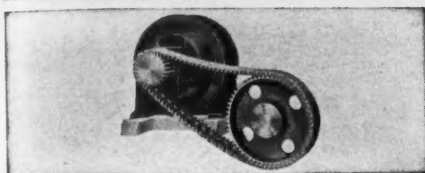


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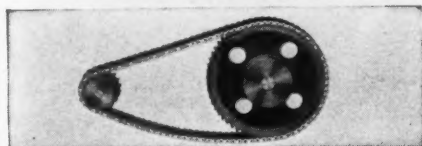
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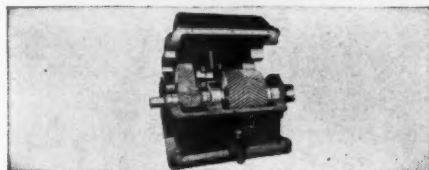
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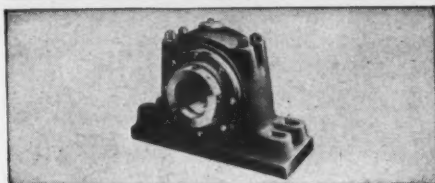


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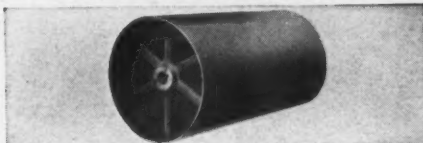


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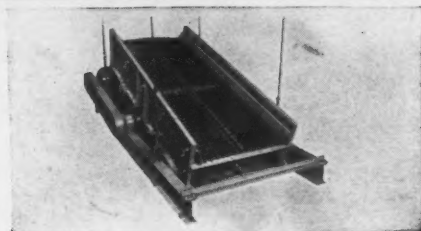


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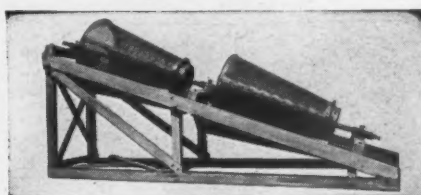


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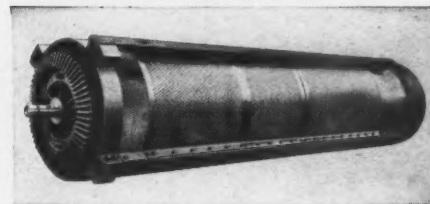
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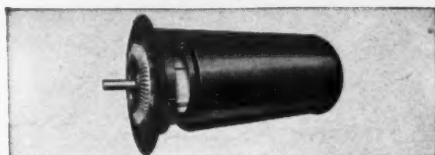


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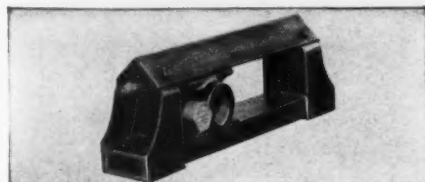


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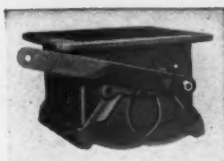
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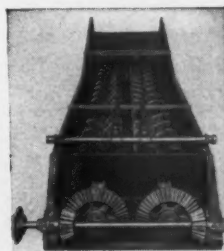
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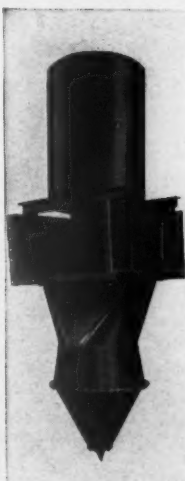
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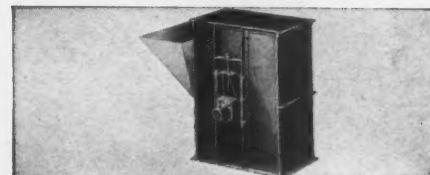
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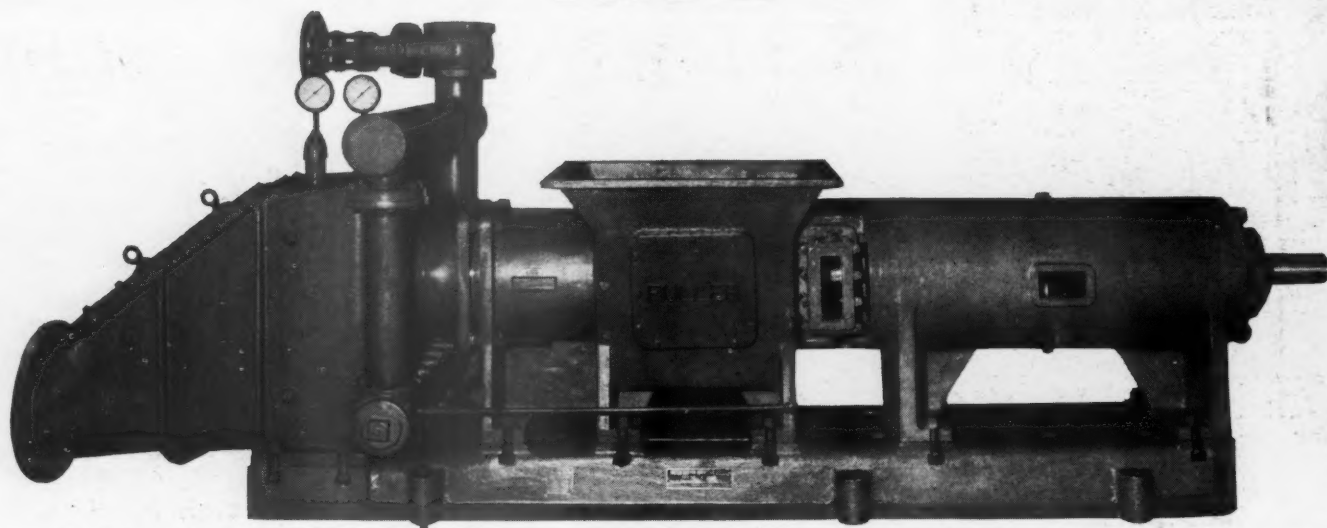
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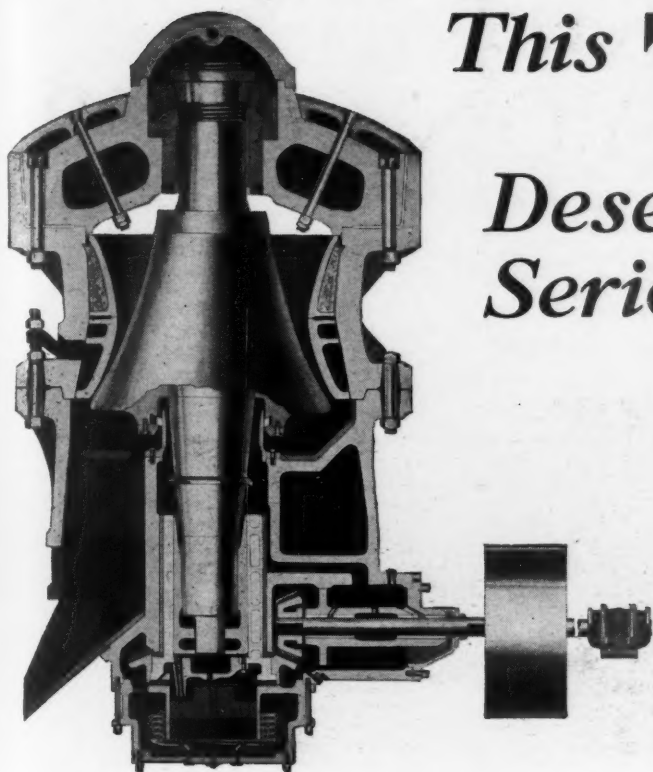
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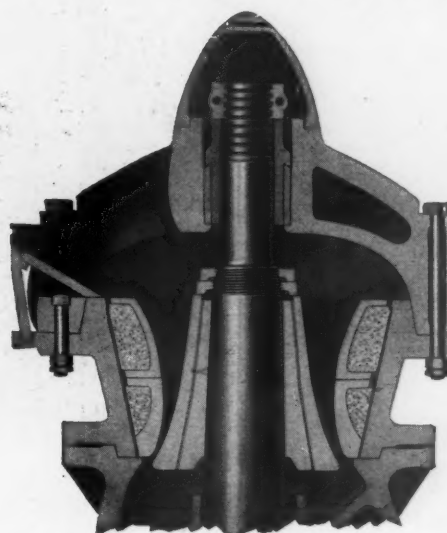
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NO CODDLING for SKF Bearings on hollow and driving shafts of this Patch-Wegner Two Post Stone Grinding Machine . . . for industry does not assign its TOUGH jobs to bargain counter bearings. These are jobs for bearings that stand up . . . take their punishment . . . and *like* it. And all industry knows that it takes a *rugged* bearing to meet demands of hard, gruelling service.

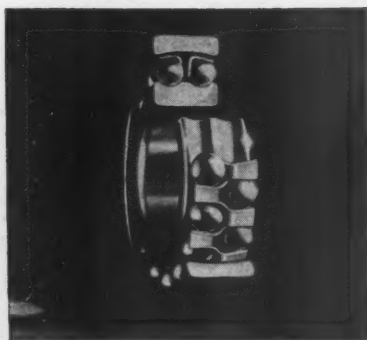
In spite of the fact that SKF's on this job work in a veritable blizzard of powdered marble, limestone, slate or granite, they maintain high efficiency . . . at all times. SKF Bearings are built to out-perform on the toughest kind of jobs . . . that's why they provide a big *margin* of performance on almost any kind of task to which they are assigned.

3204

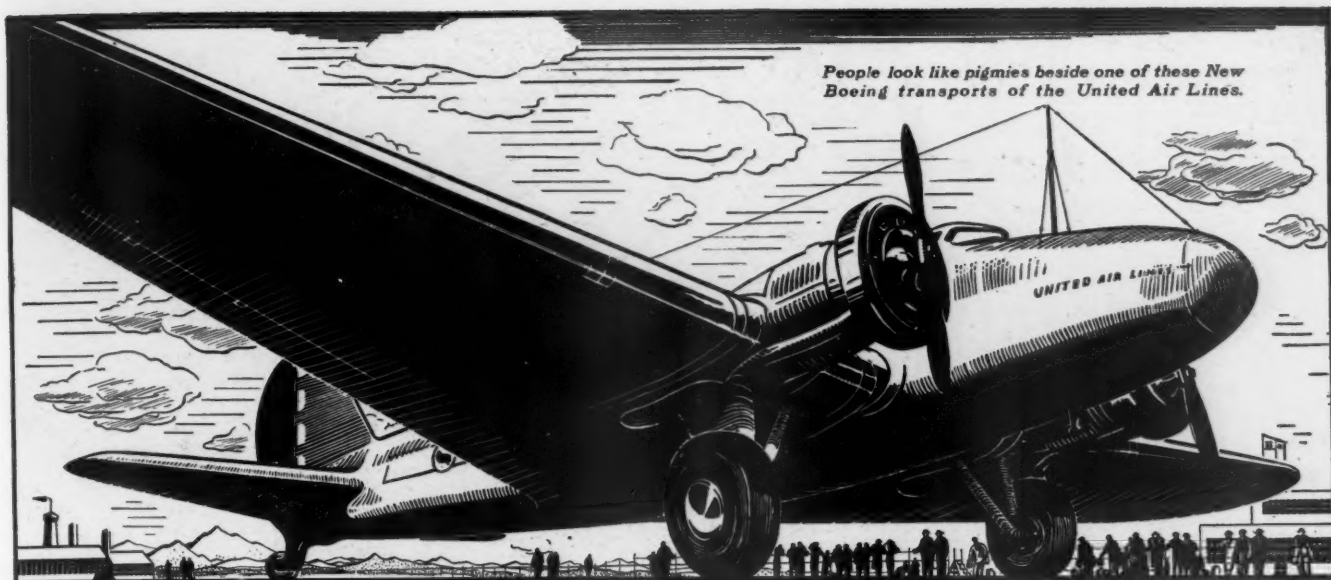
SKF INDUSTRIES, INC., FRONT ST. and ERIE AVE., PHILADELPHIA, PA.

SKF

Ball and Roller Bearings



● You may buy a bearing as a bargain but try and get a bargain out of using it, for nothing is apt to cost so much as a bearing that cost so little



People look like pigmies beside one of these New Boeing transports of the United Air Lines.

Seventy...

3-MILE-A-MINUTE BOEINGS

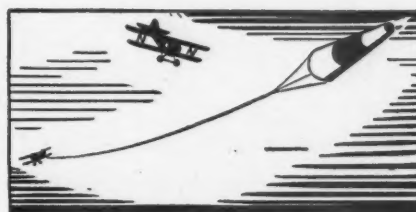
World's largest fleet of high speed multi-motored passenger planes equipped with Roebling Control Cable to insure utmost safety

Now YOU can travel like a shot ...3 miles a minute! California to New York... in 19½ hours! United Air Lines new fleet of 70 Boeing Wasp-powered transports makes this possible.

Just imagine yourself as one of the two pilots at the controls of one of these air giants....

speeding through the air...a mile in almost 20 seconds! You would want to feel mighty sure of those control cables!

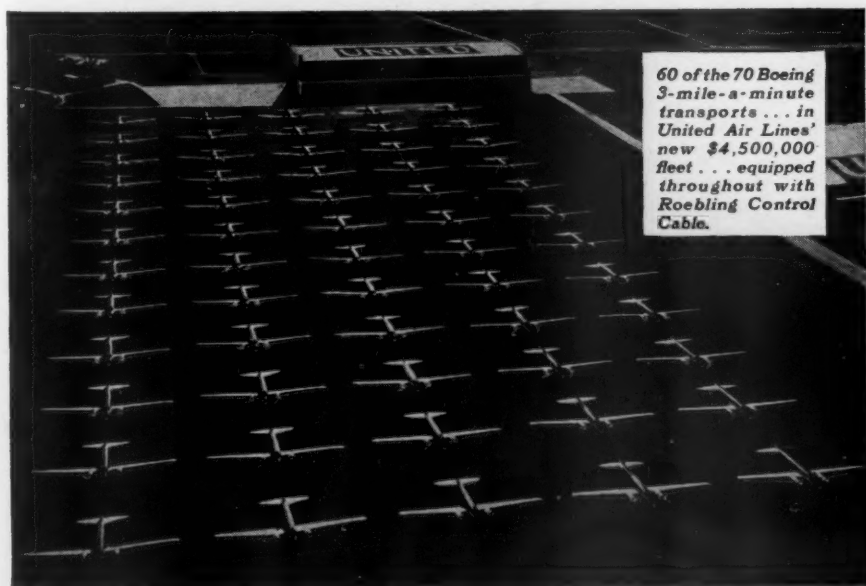
And this is how Boeing felt about it...when they designed these planes. So they equipped all 70 with Roebling Control Cable.



Target-towing...an interesting and severe use for Roebling Control Cable. Only ¾ in. in diameter, this tough cable has an ultimate strength of 1 ton.

You may not use Roebling Control Cable. But you can get the same stamina and safety in other Roebling Wire Products...including Wire Rope. Through the use of these products you have positive assurance of the utmost of dependability and economy in service.

WIRE ROPE FOR ALL NEEDS...
LARGE OR SMALL: No matter how exacting the service, or how large or small the order may be, Roebling can meet your requirements. And your order will receive the same careful, prompt attention, whether for a carload of rope or merely a few feet. John A. Roebling's Sons Company, Trenton, N.J. Branches in Principal Cities.



60 of the 70 Boeing 3-mile-a-minute transports... in United Air Lines' new \$4,500,000 fleet... equipped throughout with Roebling Control Cable.

ROEBLING

The Pacemaker in Wire Rope Development



MECHANICAL AIR SEPARATOR with Patented **WHIZZER**

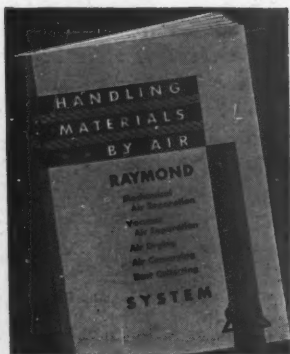


IF you appreciate the value of an accelerator on a motor car, or a booster on a pressure line—then you will understand the importance of a whizzer in a separator. Its prime function is to step up output!

That is why you get a consistently higher capacity from the Raymond Whizzer Type Mechanical Air Separator, than from an identical size classifier *minus* a whizzer.

With this greater production goes a more uniform finished product, as well as cleaner tailings and more accurate classification regardless of variations in the feed.

Built by the originators of air separation, the Raymond Mechanical Air Separator offers you many refinements in design that assure superior performance, easier control and lower maintenance. RAYMOND BROS. IMPACT PULVERIZER CO., Main Office and Works: 1307 North Branch St., Chicago. Sales Offices in New York and Los Angeles.



Write for your copy of "Handling Materials by Air." Describes applications to hydrated lime, gypsum, cement clinker, raw mix and many other materials, where closed circuit operations give high efficiency.

RAYMOND

PULVERIZING, SEPARATING, AIR DRYING AND DUST COLLECTING EQUIPMENT

"ED" AND "RED" TALK OVER THE NEW MARION LINE



"IT'S THE EASIEST MACHINE I'VE EVER OPERATED, 'ED' " " "

and I've worked plenty of levers in my day. Talk about 'finger-tip control' . . . this MARION CLUTCH TYPE EXCAVATOR sure has it. That's why I can do a bigger day's work, 'Ed', without feeling all 'dragged out' at the end of the day."

"Well, I must say, 'Red' . . . you certainly have been piling up the yards since we've had our new Marion."

"Aw, you haven't seen anything yet."

All of the operating levers required for operating the MARION CLUTCH TYPE EXCAVATOR—hoisting, crowding, rotating, propelling, boom hoist, chock brakes, power take-off, dipper trip—foot pedals for hoisting, check band and hoisting lock brake—are concentrated within easy reach of the operator—the most effective arrangement for big yardage. WRITE FOR BULLETINS.

SMALL REVOLVING GROUP

Clutch Drive

Type 340	1 cu. yd.
Type 351	1½ cu. yd.
Type 361	1½ cu. yd.
Type 371	1½ cu. yd.

Three Motor Drive

Type 471	1½ cu. yd.
----------	------------

LARGE REVOLVING GROUP

Type 5180	8 to 12 cu. yd.
Type 5480	12 to 16 cu. yd.
Type 5560	15 to 20 cu. yd.

THE MARION

STEAM SHOVEL CO., MARION, OHIO, U.S.A.

Electric » Gasoline » Diesel » Steam
Gas-Electric » Diesel-Electric
Shovel » Clamshell » Dragline » Crane » Trench Shovel

INTERMEDIATE REVOLVING GROUP

Two Belt Crawler Class

Type 480	2 cu. yd.
Type 490	2½ cu. yd.
Type 5101	2½ cu. yd.
Type 5120	3 cu. yd.
Type 5160	4 cu. yd.

Four Belt Crawler Class

Type 5120	3 cu. yd.
Type 125	4 cu. yd.

REX CHAIN

FOR EVERY DRIVE & CONVEYOR

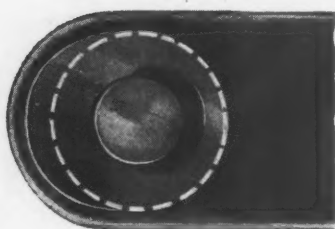
Rex Z-METAL

Where there's excess wear Rex Z-Metal Chain stops it

Where there's pounding Rex Z-Metal Chain takes it

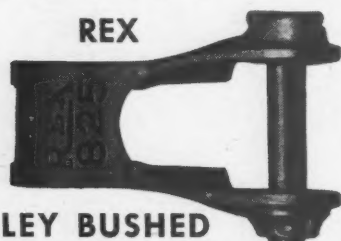
Where there's corrosion Rex Z-Metal Chain resists it . . .

The Greatest Chain Ever Cast



REX DUROBAR

The added metal on the barrel added greatly to its life—now Rex Z-Metal adds a great deal more to the longer life of Rex Durobar on heavy duty elevators.

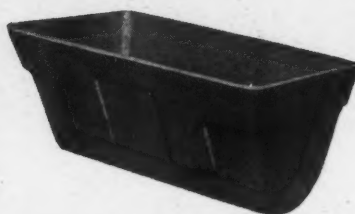


REX ALLOY BUSHED

With hardened or alloy steel bushings. Rex Z-Metal also adds greatly to the working life of this long-wearing chain on heavy duty elevators.

Send for the Folder "REX Z-METAL CHAINS"

And the Greatest Wear-Resisting Combination



REX Z-METAL BUCKETS

Rex Z-Metal Buckets, to go on these chains, will also greatly outlast malleable buckets, giving an unbeatable combination for the severe service in handling rock, sand and gravel, cement.



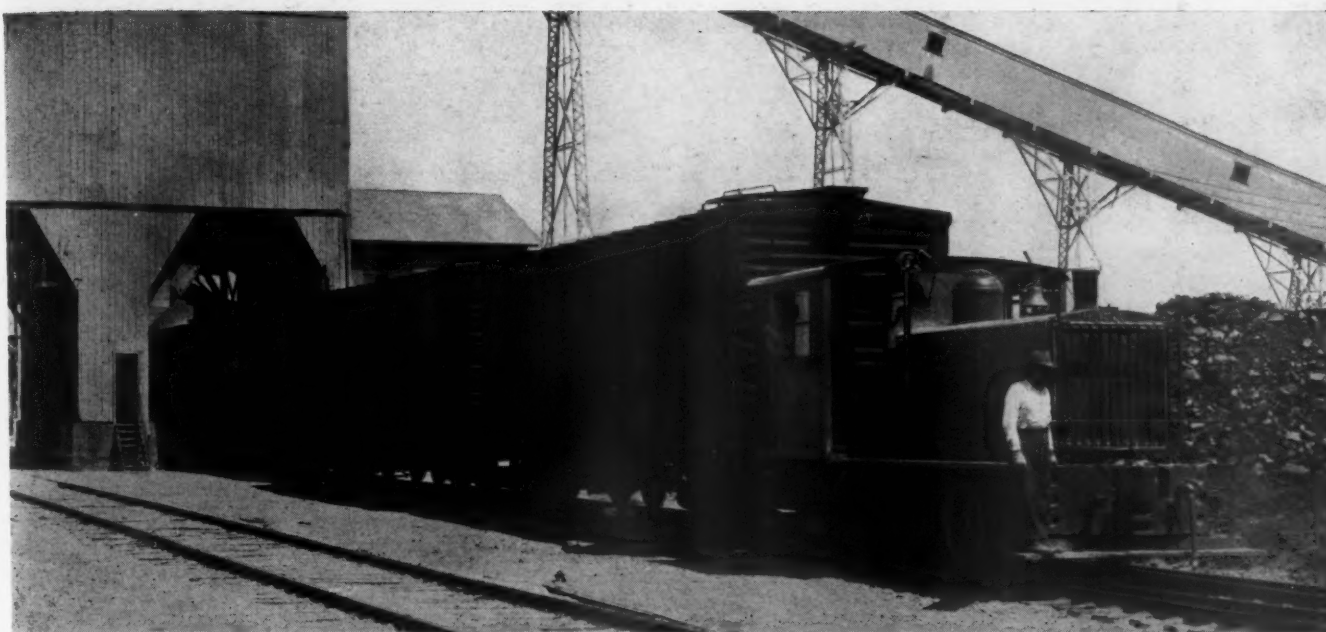
Running on Rex Alloy Temperim Sprockets

To meet the greater hardness and wearing qualities of Rex Z-Metal Chain—a new Rex Alloy Temperim Sprocket is ready, adding again to the long life that this long-lasting, wear-resisting combination will give on heavy duty service.

CHAIN BELT COMPANY

1649 W. Bruce St. MILWAUKEE, WIS.

CHAIN BELT COMPANY
CHAIN & BELT CONVEYING



A PLYMOUTH USER *writes this advertisement!*

FOR years Plymouth customers have written many Plymouth advertisements. Mr. Bert Herzog, President, The Herzog Lime & Stone Company, Forest, Ohio, writes this one:

"The 30-ton Plymouth Gasoline Locomotive which we are using at our plant for switching has given us what we consider the utmost satisfaction in performance, cost of operation and upkeep.

"This Locomotive has no trouble in handling from ten to fifteen loaded 50- to 70-ton capacity hopper cars or from fifteen to twenty-five empties. Such performance is usual in the operation of the switching at our plant.

"Anyone watching this locomotive perform will be convinced that the above statements are in no way exaggerated. Prior to the ownership of this 30-ton standard gauge locomotive we owned three Plymouth narrow gauge locomotives which were likewise highly satisfactory."

Send for free Plymouth Locomotive Bulletins

PLYMOUTH » GASOLINE » » DIESEL »
GAS ELECTRIC DIESEL ELECTRIC
LOCOMOTIVES

PLYMOUTH LOCOMOTIVE WORKS, PLYMOUTH, OHIO, U. S. A.

The **MICHIGAN** **SHOVEL** *is Your Best Bet!*

A shovel that is a master of a wide variety of quarry jobs—that's the MICHIGAN! The inbuilt features make it extraordinarily flexible.

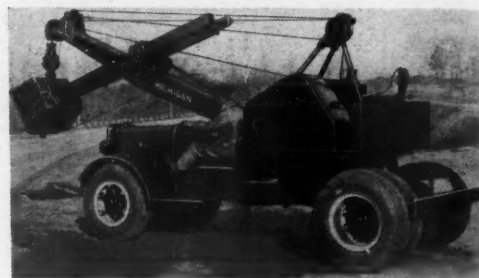
Owners will tell you the MICHIGAN is speedy, powerful and truly efficient. Moreover the power consumption is lower than average.

Let us send you the 1934 MICHIGAN illustrated folder. From it learn about the full-revolving feature; the elimination of tail swing; the pneumatic clutch and brake mechanism. **WHICH GIVES FINGER-TIP CONTROL!**

And weigh this: The MICHIGAN SHOVEL easily is converted into a dipper—crane—dragline—clamshell—whatever the situation demands. It's a master of all work!

The MICHIGAN can operate in narrow quarters where other shovels flounder helplessly. And it can travel under its own power. MICHIGAN attractions are endless. But the big illustrated folder tells the whole story.

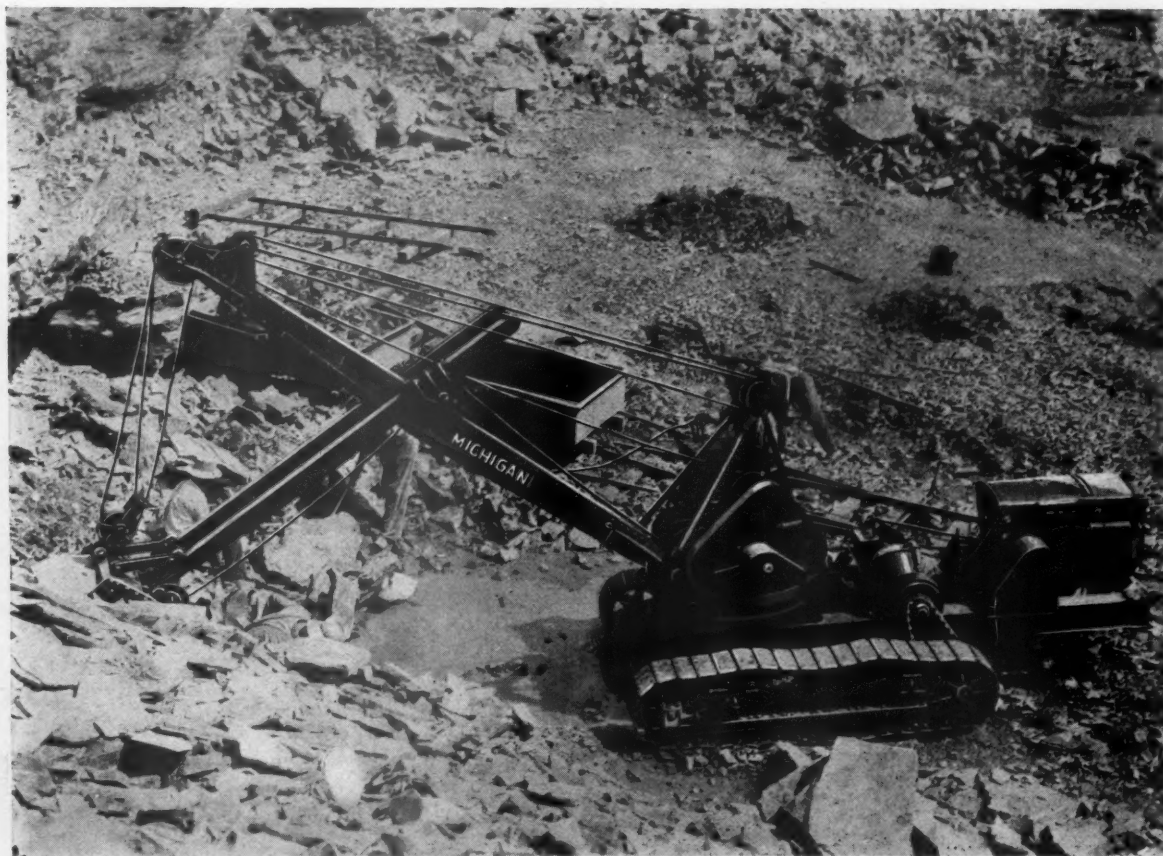
So Send for It!



**MICHIGAN TRUCK
SHOVEL**

Designed to travel rapidly under its own power. Just the thing to use where a larger, less mobile shovel cannot be used profitably. We'll be pleased to send a detailed description.

MICHIGAN POWER SHOVEL CO.
BENTON HARBOR, MICH.



Full Circle Loading . Three Quarter Digging . No Tail Swing . . .

NOW LUBRICATION EFFICIENCY *can be* **PROVED** *not just claimed*

INDUSTRIAL executives and engineers need no longer *guess* regarding the influence of lubrication on operating costs.

When Gulf's 7 Point Plan is put to work in your plant, you will *know* just what you are paying for lubrication service—and what you save by it.

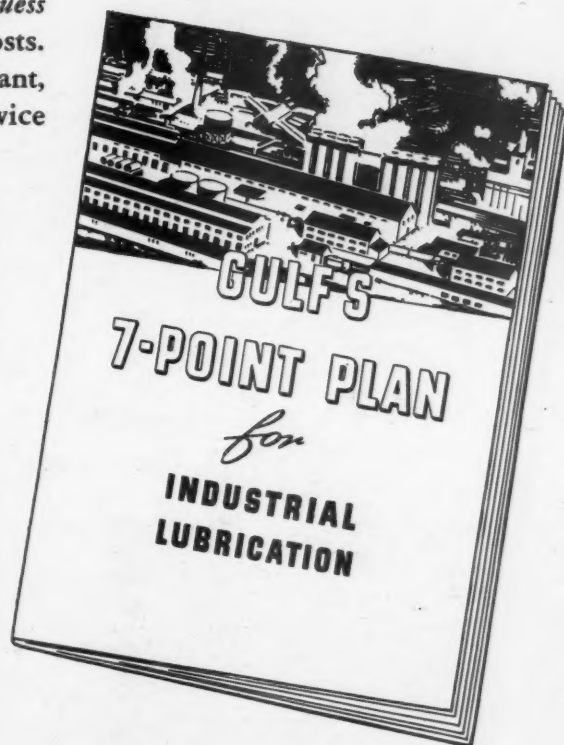
WHAT GULF'S 7 POINT PLAN FOR INDUSTRIAL LUBRICATION OFFERS

... to the management executive

1. A means of protecting and conserving the company's investment in costly mechanical equipment.
2. A scientific method of measuring lubrication costs and the influence of lubrication on plant costs.
3. A plan by which a real cost-saving program can be set up in all operating departments.
4. Greater plant efficiency from better operating conditions.

... to the operating engineer

1. The counsel and assistance of trained lubrication engineers to help you with your operating problems—on the job.
2. An opportunity to reduce power consumption and cost of maintaining mechanical equipment.
3. Ability to operate machinery at maximum speed with minimum adjustments—and resultant increase in both quality and quantity of production.



*If operating costs in
your plant must be
cut in 1934, the tools
to do the job are at
your command . . .*

GULF REFINING COMPANY PITTSBURGH, PA.

District Sales Offices:

Boston, New York, Philadelphia, Atlanta, New Orleans,
Houston, Pittsburgh, Louisville, Toledo



—WRITE TODAY—

GULF REFINING COMPANY
3800 Gulf Building
Pittsburgh, Pa.

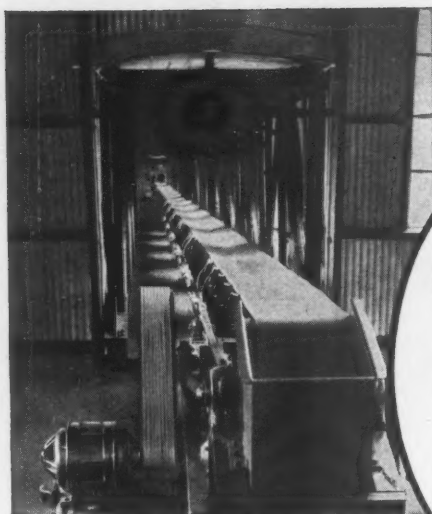
R. P.-5

Please send me, without charge, "Gulf's 7 Point Plan for Industrial Lubrication."

Name.....

Company.....

Address.....

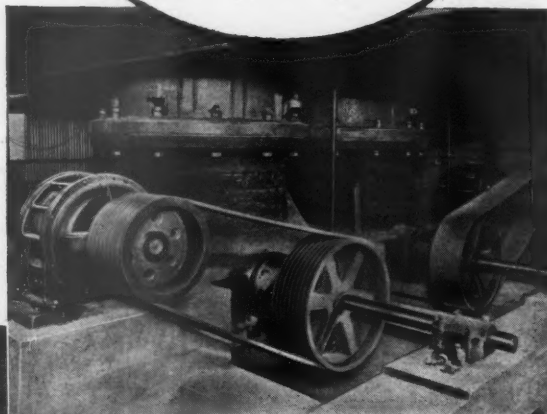


This G-E motorized conveyor handles over-size rock from the vibrating screens. For greater economy of operation, be sure to use General Electric for the RIGHT MOTOR and the RIGHT CONTROL for every type and size of conveyor.

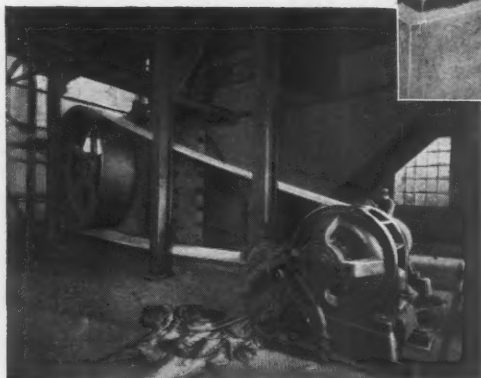
*For Your
Crushed-stone Plant
See General Electric
for Everything
Electrical*



G-E synchronous motors, with their inherent high efficiency and their ability to improve power-factor, dependably and economically drive these centrifugal pumps, which supply water for the stone-washing operations.



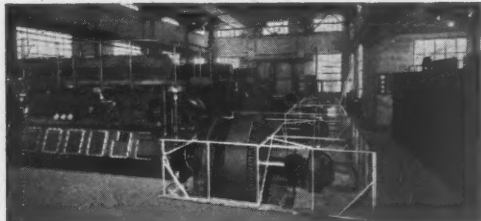
Two G-E induction motors operating finishing crushers through Vulco Rope Drives. Here, again, the RIGHT MOTOR provides greater economy.



This 250-hp. G-E induction motor drives a 56 by 72 in. primary jaw crusher. The photograph was taken during installation.

THAT'S exactly what the Hudson River Stone Corporation—in whose plant these pictures were taken—did when it equipped its new \$1,500,000 plant at Cold Spring, N. Y. This plant is G-E equipped throughout—motors, control, generators, transformers, switchboards, etc.; equipments that will stay on the job, year after year, with G-E reliability.

You, too, will find it profitable to see General Electric for everything electrical for your plant. Here your every need will be met with dependable equipment, progressive engineering, and prompt, competent service. General Electric, Schenectady, N. Y.



The power requirements of the plant are supplied by these three 450-kw. G-E generators direct-connected to McIntosh Seymour Diesel engines.



General Electric's ability to supply your every switchgear need is shown by this station board, located in the Diesel power plant.



These G-E motorized scalping screens handle the first washing operation—removal of quarry dirt.

020-30

GENERAL  ELECTRIC

PUT A GIANT TO WORK ON YOUR DOWN HOLES



Give him the most powerful
drill you can buy.

Make him use the longest steel
changes the ground will permit.

Make him drill 40-foot
holes if you need them.

Drive him--he doesn't
get tired.

Give him a chance
and he'll make
money for you.

In this Mechanical Age
the counterpart of the
mythical giant is the
**WAGON-MOUNTED
DRILL.**

Let us tell you what Inger-
soll-Rand Wagon-Moun-
ted Drills can do for you.

INGERSOLL-RAND COMPANY

11 Broadway

::

::

New York City

Ingersoll-Rand

79-RDM



Let's get one Job **DONE!**

Like working every other day, a little blast—a little digging—a little blast—a little digging—has its disadvantages.

Where practicable, the giant blast is a very profitable investment. It avoids the constant shifting of equipment, and can often supply enough material to keep the shovels busy all summer.

This book explains Cordeau and shows how to use it. A copy will be sent free—to executives.

The giant blast requires Cordeau-Bickford Detonating Fuse.

But Cordeau can also be used profitably in smaller hookups. Its use simplifies loading and insures the practically simultaneous detonation of all the holes in the shot. Because the Cordeau is in contact with every cartridge, you get more work out of your explosives—a saving that should interest you.

SAFETY FUSE AND LIGHTERS

Ensign-Bickford Safety Fuse is available in a number of standardized brands, each carefully made for a particular set of conditions. The use of Safety Fuse simplifies blasting technique.

Also—there are a number of Ensign-Bickford lighters, inexpensive—and positive in action.

CORDEAU **DETONATING FUSE** **BICKFORD**

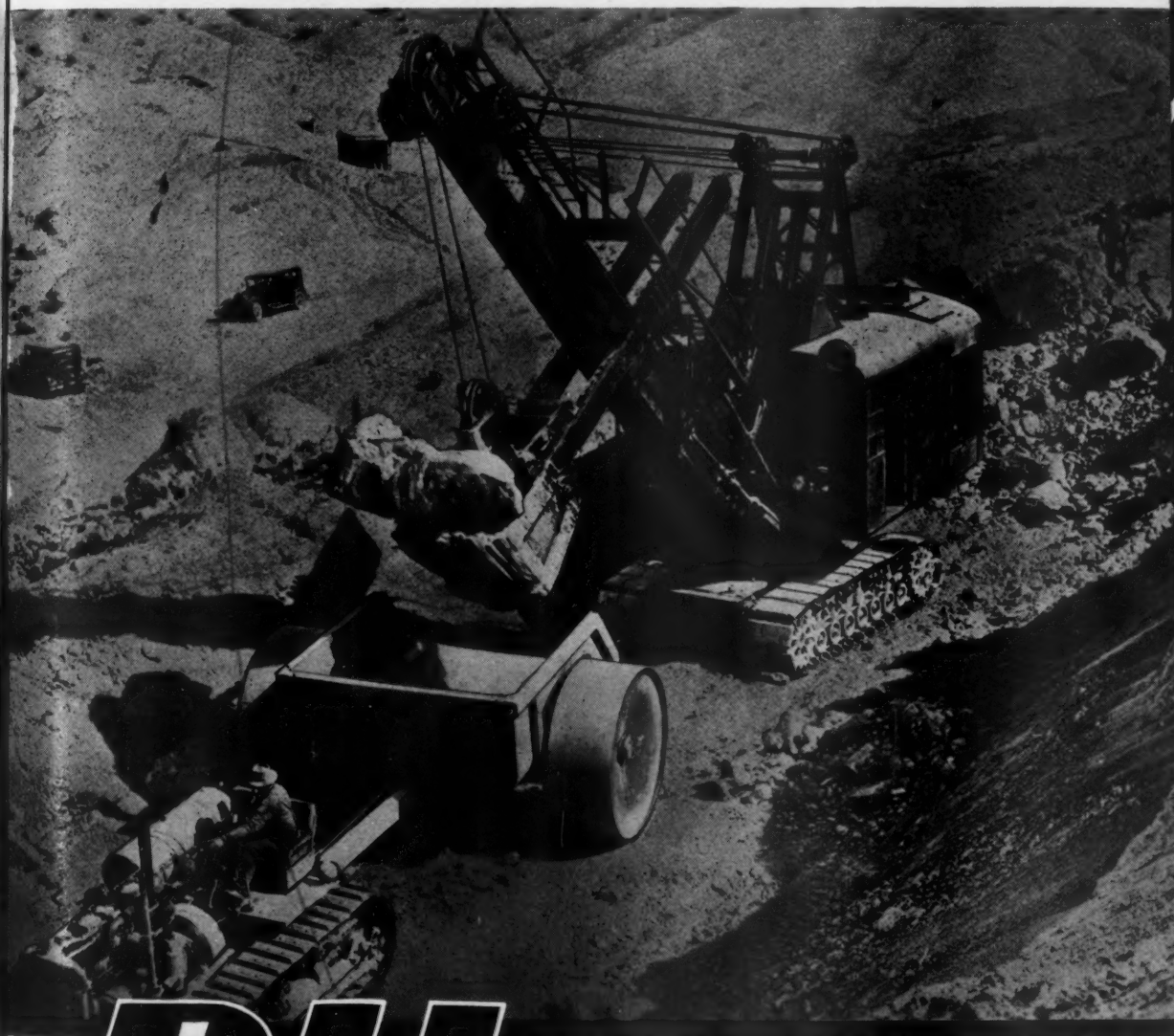
THE ENSIGN-BICKFORD COMPANY, Simsbury, Connecticut

CB30-A

from jobs like this

comes the evidence
to show how **P&H** shock ab-
sorbing construction cuts upkeep
and boosts yardage • • • •

ON jobs that punish a shovel, any man will thank his lucky stars he stuck to a P & H. New type Split Second Control clutches absorb the shocks, minimize breakage, reduce upkeep. You can be sure of steady production — week in and week out — with a P & H.



HAVE you seen the way P&H Split Second Control works? Have you felt the way it smooths out shocks—how it speeds up digging cycles? We'll be glad to show you a P&H at work.

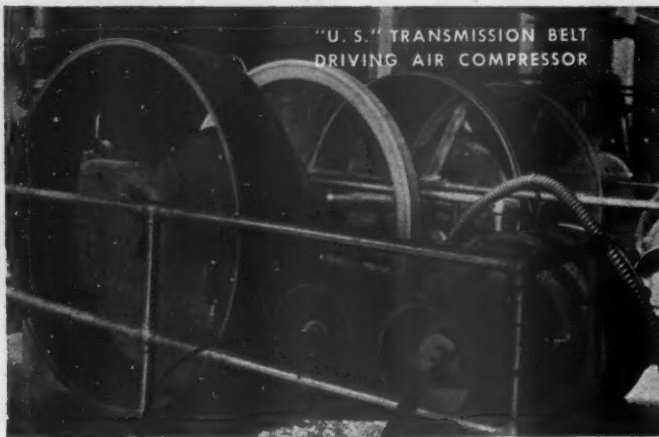
P&H HARNISCHFEGER CORPORATION

4465 W. NATIONAL AVE. Established 1884 MILWAUKEE, WIS.

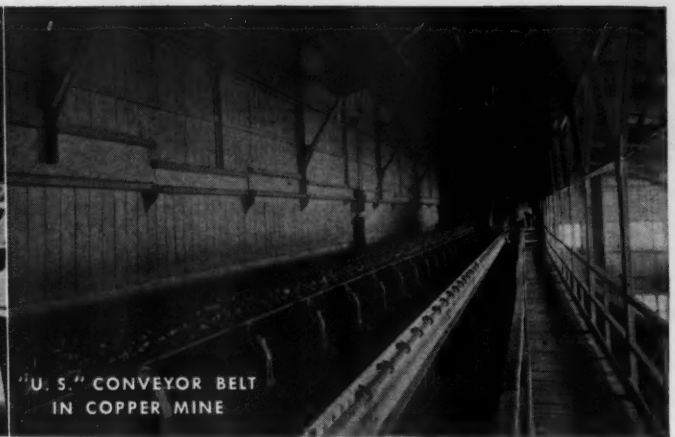
Warehouses and Service Stations:

HOBOKEN MEMPHIS JACKSONVILLE SEATTLE DALLAS
LOS ANGELES SAN FRANCISCO

the 50th year



"U. S." TRANSMISSION BELT
DRIVING AIR COMPRESSOR



"U. S." CONVEYOR BELT
IN COPPER MINE

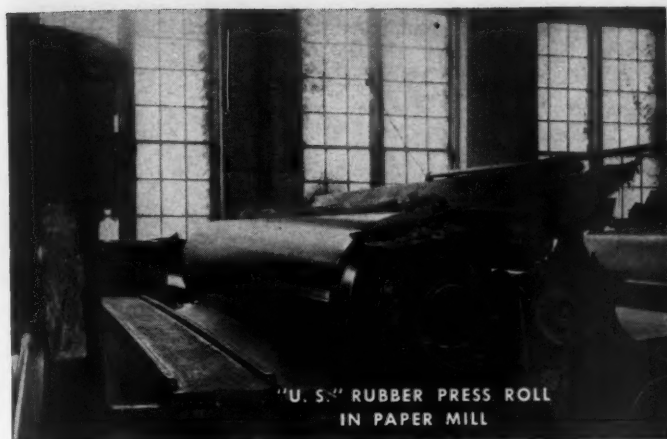
The United States
World's Largest Producer of
..makes the Most Complete
the Greatest Research
to industry a Technical
the Broadest Experience.



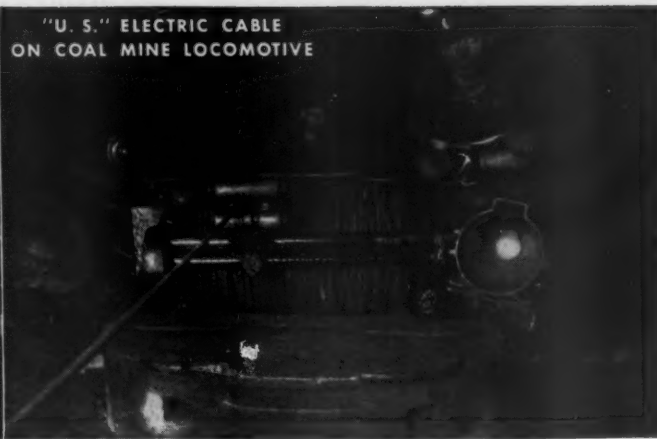
"U. S." DREDGING SLEEVE
ON RIVER DREDGE



"U. S." AIR HOSE IN
ROCK DRILL SERVICE



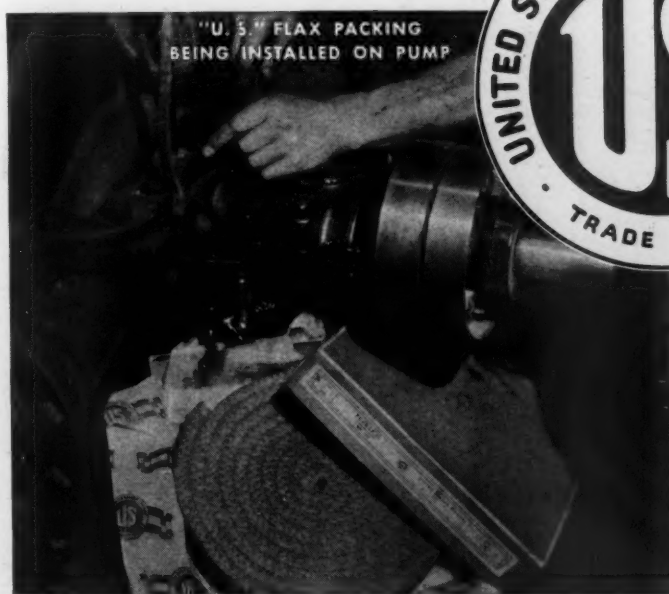
"U. S." RUBBER PRESS ROLL
IN PAPER MILL



"U. S." ELECTRIC CABLE
ON COAL MINE LOCOMOTIVE

**Rubber Company *is the*
mechanical rubber goods
Line *it maintains*
Laboratories . . *and offers*
Engineering Service *of***

.



"U. S." FLAX PACKING
BEING INSTALLED ON PUMP



"U. S." RUBBER TANK LINING
BEING ELECTRICALLY TESTED



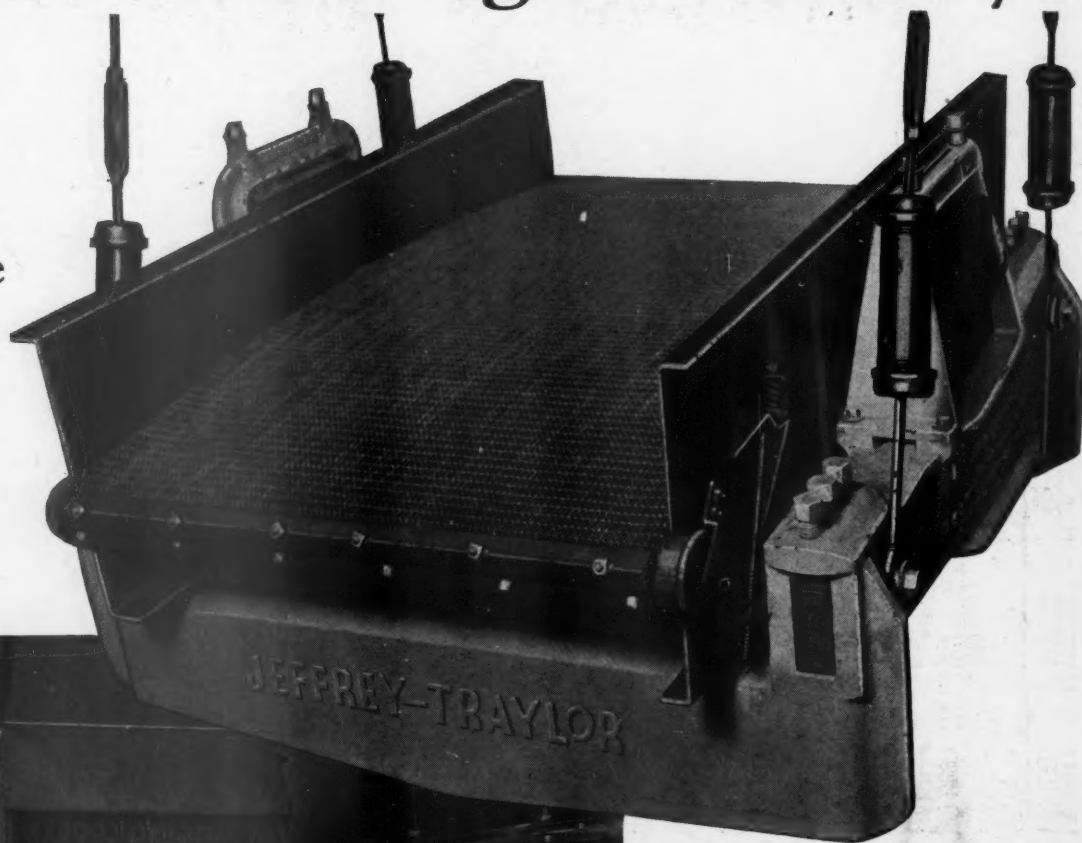
High Screening Efficiency

Great
Capacity

•
Dependable

•
Lower
Operating
Cost

(Patented)



with Jeffrey-Traylor Electric Vibrating Screens

Coarse and fine . . . wet and dry materials make no difference in the efficiency of the Jeffrey-Traylor Vibrating Screen. The sharp, pulsating vibration (3600 times a minute) is under positive control and can be instantly varied to meet the changing requirements of material variations. You are assured of tremendous capacities.

All vibration is confined to the screen. It is suspended from vibration absorbers. No heavy supporting structure is necessary as the installation is a simple and permanent one.

Jeffrey-Traylor Vibrating Screens are entirely electrical . . . absolutely no mechanical striking, or off-center parts, to lubricate and replace. Screen cloth changed in 5 to 10 minutes without special frame, tools or skilled labor.

A careful comparison of the Jeffrey-Traylor Screen with other types will quickly demonstrate its efficiency.

Supplied in single or multi-decked styles and in sizes ranging from two to forty square feet.

Our Engineering Department will gladly co-operate in the solution of your screening problems. Write today.

The Jeffrey Manufacturing Company

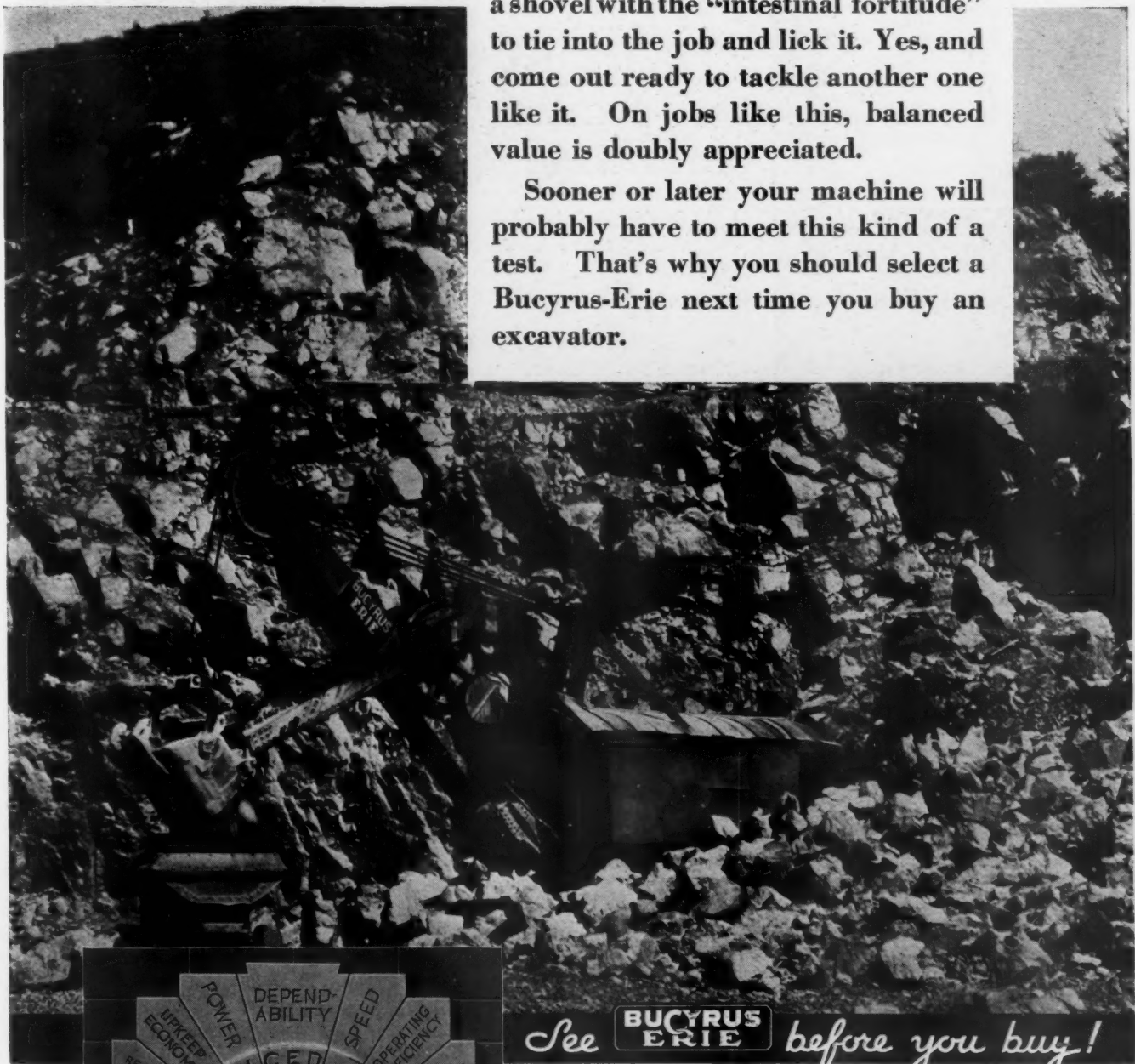
935-99 North Fourth St., Columbus, Ohio

New York Rochester, N. Y. Pittsburgh Boston Cleveland Chicago Milwaukee Denver Birmingham
Buffalo Philadelphia Scranton, Pa. Cincinnati Detroit Huntington, W. Va. St. Louis Salt Lake City Dallas
Jeffrey Manufacturing Company, Ltd., of Canada. Head Office and Works, Montreal. Branch Offices, Toronto—Calgary—Vancouver

Where Balanced Value is doubly appreciated

When you are up against digging like this you want a shovel as sturdy and staunch as they build them. It's no place for a weakling nor even for a good piece of machinery that has a weak spot here and there! It calls for a shovel with the "intestinal fortitude" to tie into the job and lick it. Yes, and come out ready to tackle another one like it. On jobs like this, balanced value is doubly appreciated.

Sooner or later your machine will probably have to meet this kind of a test. That's why you should select a Bucyrus-Erie next time you buy an excavator.



723A



See **BUCYRUS ERIE** before you buy!

BUCYRUS-ERIE CO., South Milwaukee, Wis.

Preformed WIRE ROPE IS NOT A LAY... BUT A MODERN PROCESS OF MANUFACTURE

LAY-SET **Preformed** **Wire Rope** **cuts** **operating costs**

LAY-SET is made in all sizes, grades, constructions and LAYS like ordinary wire rope. But you discover the difference when you use the first length of LAY-SET. It handles so much *easier* . . . because LAY-SET wires and strands are preformed in manufacture to the exact shape of the rope. You're handling a *relaxed* rope — seizing is no longer necessary.

In LAY-SET internal stress is eliminated. You get *full rope efficiency* on the job. Thousands of comparative service records prove this!

Preforming insures equal strand balance and reduces fatigue resulting from bending over sheaves and drums by elimination of internal stresses. LAY-SET also resists kinking and is easier to splice. Write today for complete information to

HAZARD WIRE ROPE COMPANY

WILKES-BARRE, PENNA.

New York	Los Angeles
Pittsburgh	Tacoma
Chicago	San Francisco
Denver	Birmingham
Fort Worth	Philadelphia



Since 1846

HAZARD Lay-set **PREFORMED** **WIRE ROPE**

Rock Products

With which is
Incorporated

CEMENT *and* ENGINEERING
NEWS

Founded
1896

Volume XXXVII

Chicago, May, 1934

Number 5

Recovery Progress—Trends

DEVELOPMENTS of the past month are chiefly the assurance that comes from NRA that the codes of fair competition for the various industries will be strictly enforced, and the gathering evidence that the PWA or some other Federal agency will soon embark on a huge housing program. Also evidence comes from all parts of the country that construction work is rapidly gaining headway and shipments of rock products are being made in increasing volume. With the end of CWA many local quarries and gravel pits were closed, at least temporarily, although in many communities plans are being made to continue their operation with relief funds. Producers are urged to fight such use of relief funds in their home-town newspapers as grievous waste of money, also because it is depriving honest and industrious workmen of jobs in legitimate enterprises.

Local United States Attorneys Instructed to Act

Under date of April 6 National Recovery Administrator Johnson informed all code authorities that in cases where non-compliance with codes could be supported by adequate facts the code authorities could go direct to the United States district attorney through the state NRA compliance director. General Johnson stated: "After ten days from the day you receive this, and thereafter, you should transmit cases of this character direct to the state director with a request that he turn them over to the district attorney for court proceedings. This new procedure and this request for cases does not mean that alleged violators are to be thrown into court on mere unsupported allegations; or that industry should cease its efforts to clean up its own compliance problems without resort to government. It does mean, however, that the time has passed to be lenient with the wilful violator and that where industry's attempts at adjust-

ment have failed, the non-complier must be brought quickly and surely to justice through the proper channels. Government is ready, able and willing to back up industry in accomplishing this end."

The Department of Justice has advised all United States district attorneys that hereafter they may institute legal proceedings in equity or criminal prosecutions under Section 3 (C) of the National Industrial Recovery Act. District attorneys hitherto had been required to get approval of the Department of Justice on such litigation. The Department of Justice will continue to have full responsibility for prosecution of suits to enforce the NIRA and the various industrial codes.

A. G. McKnight, Duluth, Minn., attorney, and one-time schoolmate of Donald Richberg, has been named head of the recently created litigation section of the NRA legal division. In this division are about two dozen Department of Justice men who will function under Mr. McKnight.

Recovery in Full Swing, According to Dun

Industry moved ahead vigorously in the first quarter of 1934. Increased activity, visible in a number of lines late in 1933, was extended to all major industries in the first three months of 1934, with gains in production, sales, prices, employment and payrolls recorded on a far greater scale than in the corresponding period of any recent year,

according to a survey of industry for the first quarter of 1934, which has just been completed by the research department of Dun and Bradstreet, Inc. "The extent of the industrial gains is shown in the trends of seven primary factors," the survey points out, "all of which point to but one conclusion: That American industry enters the second quarter of 1934 with recovery in full swing. The preceding months have been a period of steady progress and outstanding achievement emphasized, and made more striking, by the low level from which the forward movement began. Fundamental conditions not only have improved greatly, but the momentum of industry has been accelerated sharply."

Unemployment Reaches New High Mark in April

With the ending of CWA the peak of the relief burden will be reached this month, Federal Relief Administrator Harry L. Hopkins believes, and a decrease from May until early next Fall is expected. But despite the prospects for increased employment the permanently unemployed, says Mr. Hopkins, will be "on our hands for years." The total number of unemployed is decreasing but the percentage of unemployed who have been forced to ask for help has increased and may be expected to continue to rise during the next few months. Several millions of persons who were employed during the period before 1929 have permanently lost their old jobs and will remain out of work even with the return of prosperity. Mr. Hopkins finds that on the basis of reports from 140 cities and urban counties the number of relief cases in the United States increased 13% and expenditures rose 20% during March over the preceding month. He estimates there are 4,700,000 families now receiving relief, or 100,000 more than during March, 1933, when the indices of business activity reached the lowest points of the depres-

With short work days and 5-day weeks the problem of keeping employees in isolated communities interested comes about: Here's the baseball team of the Estill Springs Sand and Gravel Co., Estill Springs, Tenn., ready to meet any competitor in its class



sion. His figures shows that one person out of every seven in this country, or 18,000,000 are now dependent on relief funds.

Pending Legislation Prevents Capital Investments

There is a potential outlay of \$100,000,000 for capital goods equipment in the cotton textile industry during the next 18 months, according to George A. Sloan, chairman of the Cotton Textile Code Authority. Commitments have been made for about \$14,000,000, but in the main the figures relate to commitments which the industry is anxious to make but will not on account of the pending Wagner and Connery bills and the Securities Act of 1933. Mr. Sloan's statement results from a survey made by the Cotton Textile Code Authority undertaken at the recommendation of the Consumer's Goods Industrial Committee, with the realization that nine-tenths of present unemployment is outside of the industries for consumers goods, and that unemployment is especially acute in the production of capital goods. The report says that mill after mill stressed the lack of confidence in the present situation.

Steel Industry Raises Prices

The steel industry's answer to the recent Federal Trade Commission's report criticising its open-price plan as tending toward high prices and monopolistic practices has been to announce a further increase in prices to cover increased costs as a result of the recent 10% wage increase. Some confusion exists as to the effective date of the increases since announcements were not made simultaneously by all producers. It is reported, at this writing, that this would be settled by making the increases effective 10 days from the latest or last filing.

Evidence that the smaller steel companies are in favor of operating under terms of the code of the iron and steel industry was contained in a pamphlet made public April 12 by the American Iron and Steel Institute. The pamphlet contains copies of several telegrams sent to Washington by small producers after the Federal Trade Commission had delivered its recent report in which it was alleged that operation of the code to promote monopoly and enable the larger companies to eliminate their smaller competitors. Without exception the messages contained in the pamphlet protested against the commission's findings and praised the code as the "backbone of their own recovery efforts."

Special Cabinet Committee to Study Prices

President Roosevelt has appointed a special committee of four cabinet members to study price posting under codes with the objective of determining the need for a coordinated Federal policy on the subject of prices. The committee is made up of Attorney General Cummings, chairman; Secretary of Agriculture Wallace, Secretary of Labor Perkins and Secretary of Commerce Roper. As an alternative, Secretary Roper

appointed John Dickinson, Assistant Secretary of Commerce, who has already undertaken a study of price and cost finding processes under the new deal, it was announced. The setting up of the new price committee followed condemnation by the Federal Trade Commission of price posting provisions in the steel code and NRA reports to General Johnson advocating the use of open price associations.

Darrow Committee Report Made to President

According to recent news from Washington, D. C., President Roosevelt's advisory review board on NRA codes has completed a preliminary report sharply criticising the operation of the national recovery act under General Hugh S. Johnson. The board is headed by Clarence Darrow, Chicago criminal lawyer and union labor advocate. The report as drafted sets forth that from the studies the members of the Darrow organization have made they are convinced that the codes thus far examined are developing a monopolistic trend and are doing injury to the small industrialist and business man. This first accounting to the President by the review board is described as general in its character and is to be followed by more detailed reports concerning the individual codes which come up for review, together with suggested amendments which would be designed to protect small enterprise from some powers which have been granted under the original codes. The preliminary report is predicated upon information obtained by the board at public hearings on more than a half dozen codes, including those governing the moving picture, bituminous coal, electrical, steel, cleaning and dyeing and ice industries. The board is continuing its hearings with a view to taking up all codes about which complaints have been made.

Construction Work Actually on Up Grade!

March contracts for construction of all descriptions amounted to \$179,161,500; this was almost twice the total reported for February and about three times the volume of March, 1933, according to F. W. Dodge Corp. Increases were scored in each of the four principal classes.

For the first quarter of 1934 contracts totaled \$462,341,500 in contrast to \$196,026,800 in the corresponding quarter of 1933. For residential building the gain over 1933 to date amounted to about 46%; for non-residential building the increase was almost 85%; for public works the 1934 volume was more than 3½ times the size of the 1933 total; while for public utilities the first quarter's total was about 2½ times as great as in the corresponding period of 1933.

The Dodge bulletin states: "During the second quarter of 1933 contracts for all classes of construction in the 37 states as a whole totaled \$236,086,600. For the second quarter of 1934, contracts in the same territory should exceed \$375,000,000 by a fair margin. Of the contract volume for the

second quarter of the current year it is probable that at least 70% of the total will represent publicly-financed undertakings. During the initial quarter of the year this class of work, totaling almost 350 millions, represented 75% of the contract total."

State Director of Employment Has Argument With Quarry Operator

The state director of reemployment under PWA at Emporia, Kan., recently caused the shut down of the Langley Bros. quarry near there because he contended that one or more men had been employed at the quarry who had not been certified to by the reemployment bureau. According to a local newspaper there is an argument over the necessity for a commercial crushed stone producer to get his employes through the National Reemployment Agency. The quarry operator has a contract to furnish stone on a PWA highway job. The crushed stone producer claimed that so long as he complied with the code of his industry he could ignore the national reemployment office. The Reemployment director holds that by congressional action, employes handling the processed material supplied to Public Works projects must be cleared through the national reemployment office. The material is being prepared for the use of the C. J. McCoy Construction Co., which has the contract for the Highway 50S paving in the vicinity of Saffordville and Plymouth.

Cement Manufacturers Protest Competitor's Bid

Protests of Oregon cement manufacturers that a California competitor submitting a bid for the Bonneville dam cement did not comply with the code of fair competition for the cement industry have been taken up by Senator McNary, of Oregon, with General Markham, chief of engineers. Complaints from Oregon say the California concern violated an executive order of the President, which insists that all bids for government supplies be accompanied by a certificate of compliance under the NRA. General Markham has requested the division engineer of the Pacific coast to investigate and advise of the situation.

Urge Revision of 1933 Securities Act

The Durable Goods Industries Committee, (elected by the code authorities of the capital or durable goods industries following the Conference of Code Authorities in March) is urging modification of the Securities Act of 1933 to permit a return of private capital to industry. In the month that the committee has been functioning and making a scientific and intensive analyses of the entire recovery program it has found some startling by-products of the federal program: The federal government now owns over one-fourth of the preferred stocks of all banks. Through federal relief agencies the United States Government will soon hold the majority of mortgages on homes and farms.

Pending legislation in both houses of congress indicates that all communications will be controlled by a federal commission. Federal relief and loans to railroads long under government control more and more indicates that the interstate carriers will ultimately be entirely federal controlled and operated within a few years.

The committee also contends that the proposed Securities Exchange Act of 1934 threatens a serious interference to recovery. The committee states it is becoming increasingly evident that in the worthy attempt to protect the average investor against the occasional fraudulent issuer and unfair manipulative practice, the great majority of honest American business men and bankers have had imposed upon them such impossible liabilities and penalties, that few prudent men are willing to risk the issuance or sale of securities. The result is the almost complete stoppage of the flow of private savings into the normal channels of investment.

South Upset Over Wage Differential Conflict

There is a general fear among Southern industrialists that NRA will soon attempt to scale down wage differentials between North and South, as is being done in the coal industry. A meeting was held in Birmingham, Ala., April 18, attended by 250 business leaders. Numerous speakers were so "het up" that, according to newspaper reports, they likened the present situation to the economic conflict which brought on the Civil War. Theodore Swann, prominent chemical manufacturer, well known in the rock phosphate industry, declared that "before we are through with this wage differential business we are going to have a secession." Lindley C. Morton, industrialist and Southerner by adoption, remembered by cement manufacturers as president of the former Phoenix Portland Cement Co., warned against raw emotions and talk of secession. To secede would lose the South the market that takes 80% of its products, he pointed out. Questioned after the meeting of the industrial council Mr. Swann said his comment on secession was intended to mean secession of the South from the NRA rather than from the Union.

Contractors to Urge More Federal Construction

The Code Authority for the Construction Industry, the governing and advisory boards of the Associated General Contractors of America will meet in Washington, D. C., May 4 and 5, coincident with the annual meeting of the Chamber of Commerce of the United States. With the volume of construction activity under the present PWA program estimated to reach its peak of between 100 and 125 million dollars during the month of August of this year, and faced thereafter with a decline at the rate of \$25,000,000 per month, officials of the Associated General Contractors and other leaders of the construction industry believe that sub-

stantial additional Federal funds for construction are immediately essential to the success of the recovery program, and the contractors will urge such appropriations at their May meeting. "The Associated General Contractors have been working wholeheartedly in coöperation with the Construction League and representatives of other branches of the industry to prevent a catastrophic drop in the construction market when the present PWA program tapers off, and to assure continuation of Federal support until such time as private industry may reasonably be expected to go forward at its normal rate," E. J. Harding, managing director of the contractors' association, states. "We believe that construction is the key to capital goods revival."

Cold Laid Bituminous Concrete Industry Under Aggregates

National Recovery Administrator Hugh S. Johnson granted his approval April 5 to the petition filed by the Cold Laid Bituminous Concrete Manufacturers for a special division under the approved code of fair competition for the crushed stone, sand and gravel, and slag industries. General Johnson acted upon the recommendations of Deputy Administrator C. L. Hickling and Assistant Deputy R. E. Plimpton after a public hearing on the petition held on February 1, 1934. The cold laid concrete industry had previously made attempts to be included in the code for the construction industry, but lack of proper representation on the code authority apparently thwarted these efforts.

Code Supplements

Supplements to the construction industry code already make provision for including the general contractors industry; painting, paperhanging, and decorating industry; elevator manufacturing industry; cement gun contractors industry; and tile contracting industry. The decision of the cold laid concrete industry to petition for a division under the master code for the crushed stone, sand and gravel, and slag industries, and the subsequent approval of this petition, do much to strengthen the position of the aggregates group.

"Do As We Say; Don't Do As We Do"

Oil Administrator (also PWA administrator, also Secretary of the Interior) Harold L. Ickes has approved an order exempting the U. S. Navy's fuel oil supply from the requirements of the code for the petroleum industry. Other purchasers must buy at the posted price but Uncle Sam still wants to compel real competitive bidding. Which prompts the *Chicago Tribune* to remark editorially: "No taxpayer can reasonably oppose this decision; it means a saving of money to the government and hence to the taxpayers. Citizens are left to marvel, however, at the government's inconsistency. It is essential, says the government to permit the oil companies to enter into what used to

be called price conspiracies at the expense of the purchasers. Unless these agreements are permitted there can be no recovery from the depression. The only customer excepted is the United States government, which is by far the largest of all. Mr. Ickes previously worked himself into a lather because the cement companies refused to bid competitively on the government's contracts, although Gen. Johnson insists that competitive bidding must be abandoned. Mr. Farley waited until Mr. Roosevelt had demanded shorter working hours and higher pay for the employes of industry generally before laying off thousands of postal clerks. The government's motto is, 'Do as we say; don't do as we do.'"

Labor Makes Some Threats and Loses Caste

Industry is actively opposing passage of the Wagner labor bill which, it is universally recognized, would practically compel the unionization of all industry. However, labor itself has been the most effective agency in preventing its acceptance in its original form. A delegation of seven union workers in the steel industry recently called at the White House, and according to *Iron Age* "left with Marvin H. McIntire, a secretary to the President, a tart statement addressed to the Chief Executive. The amazingly curt tone of this document, speaking directly to the President of the United States, has few parallels. Protesting that the Department of Justice action was not drastic enough, because 'it does not force Weir to deal with our union,' the delegation in its statement said: 'We call upon you to get Weir to comply with the NRA within 48 hours, or get the Wagner bill passed this week, or else stop pretending that any immediate and effective action by the Government is possible.' The President disregarded the ultimatum."

Industry Must Pay Costs of Code Administration

President Roosevelt on April 14 issued an Executive Order that all members of an industry must pay the dues prescribed by their code authorities, and approved by NRA, or go without Blue Eagles. A new Blue Eagle design is being prepared for code industries. Without a Blue Eagle they can't get any business for which Federal money is being appropriated, either directly or indirectly.

Gives American Cement a Chance in Virgin Islands

An increase to 20% from 10% in the differential between American and foreign materials purchased for public works projects has been announced by the Interior Department. A protest by the Florida Portland Cement Co. that foreign cement was being bought for PWA projects in the Virgin Islands at prices which underbid American companies caused the Department to make the increase.

Aggregate for Golden Gate Bridge Concrete

Handling and Batching From Railway Cars to Barges to Bins
and Batching to Mixer Trucks

By Edmund Shaw,

Contributing Editor, Rock Products

IN the Golden Gate Bridge construction there are about 600,000 cu. yd. of concrete, in the anchorages, the piers that support the great steel towers for the suspension cables and the viaducts, as the approaches are called. It is the size of these piers and anchorages that makes the total yardage so great, for this is a suspension bridge with the longest span that has been attempted and the supporting members must be correspondingly large and heavy.

However, the concentration of the work in a few units makes the mixing and placing of the concrete somewhat simpler than it is on the Bay Bridge Job, which was described in ROCK PRODUCTS for March. The work on both sides of the Golden Gate can be reached by trucks and consequently the concrete can be conveyed in truck mixers. Pouring is either by buckets directly into the forms or by the familiar concrete chutes. So the work has more nearly the characteristics of an ordinary big concrete job than has the Bay Bridge, where it was found economical to bring batched material instead of mixed concrete to the job and to pour it in different ways, each adapted to some peculiar condition of the work.

**Pacific Coast Aggregates, Inc.,
Contractor**

All the concrete work was awarded by contract to Pacific Coast Aggregates, Inc., which is the largest producer of aggregates on the Pacific Coast and one of the largest in the United States. It supplies all the aggregates that are used on the San Fran-

cisco side of the bridge. On the Marin side it supplies a third of the aggregates, the remaining two-thirds being equally divided between the Blake Brothers Co. and the Basalt Rock Co. The batching arrangements are the same in principle on both sides and the method of mixing and placing is the same.

Unloading Railway Cars to Barges

All materials, cement and aggregates, come to the batching plant by water. There are aggregates which are shipped from producing plants by rail, but the railroad cars which bring them are unloaded into barges. The wharf where this is done is at Oakland Mole, the next pier to that which has the batching plant for the Bay Bridge concrete. There is a 42-ft. opening in this wharf and the tracks are carried across it on steel girders. The barge to be loaded is spotted below and the hopper bottom cars are dumped directly into it. There is no hopper below the cars, but there is a grating which is very effective catching the sacks used for caulking cars, and it is also a safety device. At low tide the barge is from 10 to 12 ft. below the track level. The loaded barge is towed across the bay and around the end of the peninsula, on which San Francisco stands, to the Golden Gate.

If the barge is for the San Francisco side it arrives at the end of a long pier on Fort Point, built to contain the batching plant and the necessary transporting units. A Wiley "Whirley" electric crane of 3½ cu. yd. capacity unloads the aggregates and places them in the storage bin at the end of

the wharf. This bin is divided into three compartments, each holding 500 tons.

Batching Bins

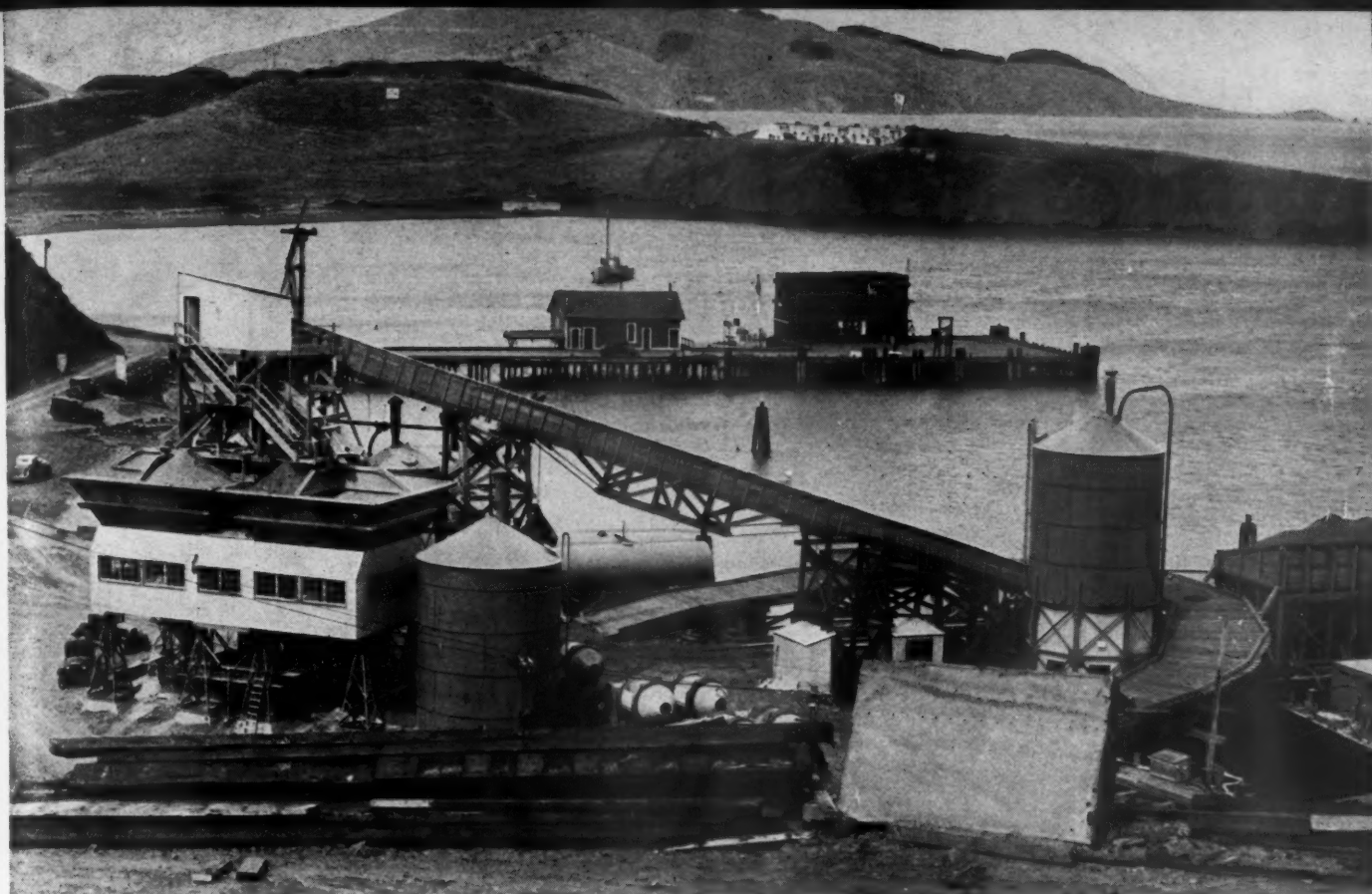
From this bin the aggregates are conveyed to the batching bins by a 24-in. belt of 465 ft. centers. It runs on Link-Belt and Sterns anti-friction idlers and gives thoroughly satisfactory service, keeping up with the peak load capacity of 180 cu. yd. of concrete per hour of the batching plant, although this demands something more than the rated capacity of such a belt as usually given. The belt is covered in, mainly to protect it from the winds that occasionally come in strongly from the Pacific through the Golden Gate.

Cement is also delivered by barges to this plant, and only bulk cement is used. It is pumped from the barge by a Type B portable Fuller-Kinyon pump to a storage tank which holds 500 bbl. The pipe line from the barge to this tank is 200 ft. long. A stationary Fuller-Kinyon pump then sends the cement through a 250-ft. line, with a 60-ft. vertical lift to the two tanks from which the cement is batched. Each of these holds 1500 bbl.

The batching plant is a double unit. Each of the aggregate bins holds 250 tons and is divided into four compartments, two for coarse rock and one each for fine rock and for sand. All compartments are provided with double clamshell gates which are manually operated. But all these gates are interlocked so that one cannot be opened until all the operations that should precede its opening have been performed.

Unloading facilities and batching plant of Pacific Coast Aggregates, Inc., used for Golden Gate Bridge project





Marin side of Golden Gate Bridge batching plant

These bins and the batching hopper were designed by the Blaw-Knox Co. The upper part of the bins is of timber and the lower part of steel.

The gates feed into a 200-cu. ft. batching hopper, and the aggregate batches are weighed on Fairbanks-Morse multiple-beam scales. The beams are interlocked the same as the gates are interlocked. Cement is batched on scales of the same make, which are provided with the electric eye control to insure exactness in weighing. There is no recording apparatus as there is in the Bay Bridge batching plant, although, of course, a very accurate record is kept of the number of batches and their components.

The batches are of 4 cu. yd. each and they go into Transit mixer trucks, which are an important part of the equipment, since so much depends on their operation. All their water tanks have air ram control of inlet and outlet valves with siphoning arrangements to insure exactness in the measuring of the water. The mixing trucks all have governors to insure that every batch gets its full mixing time. This time is four minutes at the rate of 13 to 14 r.p.m., and the governor does not permit the revolution counter to register unless the mixer is running at the right speed. So it is certain that every batch delivered has had at least the full mixing time.

Although the same in principle, the batching arrangement on the Marin side of the Gate differs somewhat from that described. The main difference in operation is that the barges are unloaded by two Brownhoist locomotive cranes in the place of the Wiley "Whirley" that is used on the San Francisco side. After unloading, the cement and ag-

gregates are conveyed to the batching bins in the same way as on the San Francisco side, a 24-in. belt for the aggregates and two Fuller-Kinyon pumps for the cement. The same type and size of Transit mixer trucks are used.

Characteristics of Aggregates

While the aggregates come from some of the same sources that furnish aggregates for the Bay Bridge, the specifications are quite different. This is because of the different methods used to design and control the mix. On the Bay Bridge job the first step is always to combine the materials to produce the standard grading. On the Golden Gate job the combination is made to produce a standard fineness modulus. But the calculations of the percentages of each of the aggregates used, which is made from the fineness moduli of the different aggregates, produces the combination which is nearest to the standard grading, that which is represented by the standard fineness modulus. So the effect is the same, the difference being only in the manner of working.

As the mix design is by fineness modulus, the specifications include the fineness moduli of the different sizes of aggregates. These are:

Material	Fineness Modulus
Sand	3.12 (tolerance of 0.20)
Coarse aggregate....	7.80 to 6.80
1½ to 2½-in.....	8.65 to 7.64
¼ to 1½-in.....	6.94 to 5.96

The sand specification also says that not less than 85% shall pass No. 4 sieve and not less than 10% nor more than 30% shall pass No. 50 sieve, and not more than 3% shall be removed by decantation.

The cement specifications call for cement to meet the standard A. S. T. M. specification C9-30, and all the work in the anchorages and the Marin pier has been to this specification. These are not in sea water. While the writer was in San Francisco there was some talk as to the possibility of changing the specifications so that high silica cement could be used in the south pier and fender which are exposed to sea water.

Design and Control of Mix

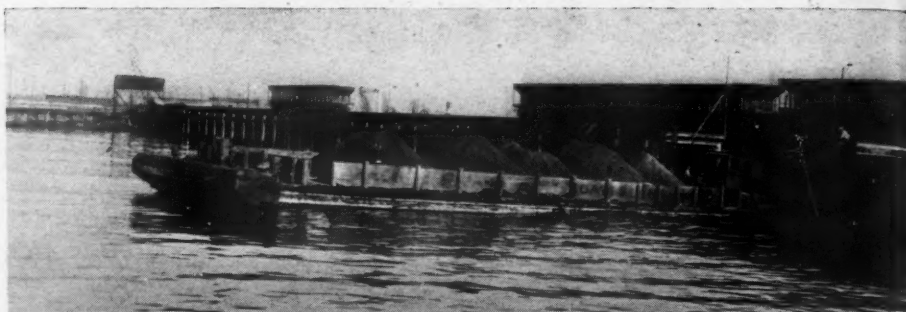
The operation of concrete plants is under the direction of T. MacManaman, a concrete engineer of San Francisco, who had had charge of the concrete work on several large jobs. He was formerly with the concrete technologist, Joseph Kitts, whose office has sent several competent engineers to build big dams and other large construction on the Pacific coast.

Since these bridge jobs are in the same district, and use the same materials, and since the work of both is in the hands of engineers whose reputations and previous experiences show them to be fully competent, one cannot help comparing the equipment and methods of the two. It would be very easy to say that this is because conditions are different, but that would hardly be a satisfactory answer, for personal opinions and experience enter into these differences.

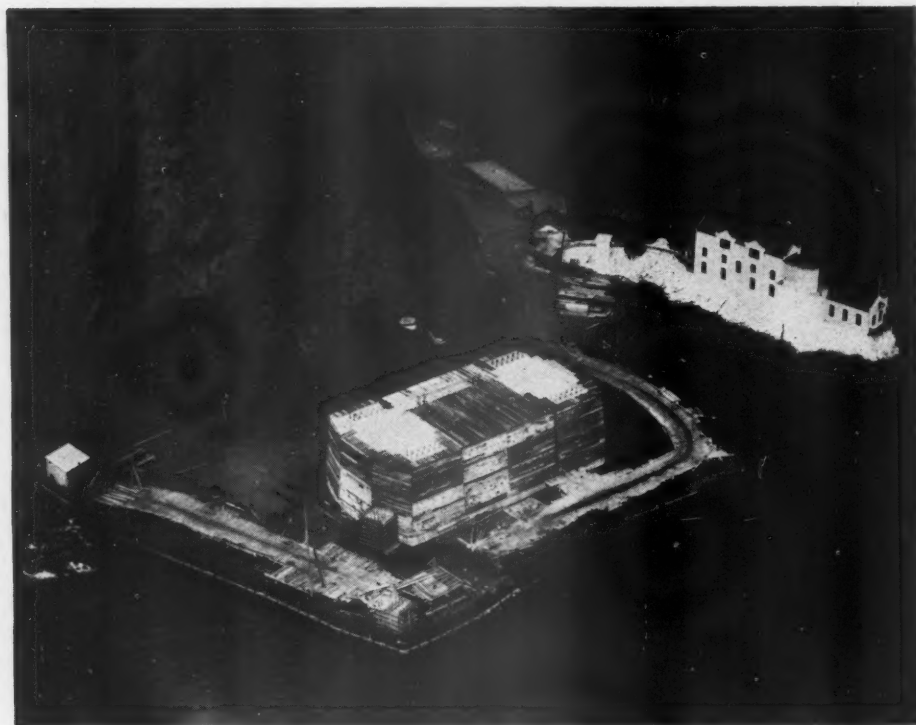
First as to the equipment. The two plants are designed to have approximately the same capacity. The writer does not know the peak load of the Bay Bridge batching plant, but that of the Golden Gate Bridge has been proven to be just what it was designed to be, 180 cu. yd. per hour, or 4320 cu. yd. per day. (Next page.)

Of the two, the Golden Gate Bridge batching plant appears to have the better and simpler arrangements for handling, and it employs less men. While one plant is feeding mixer barges and the other transit mixers, there is no apparent reason why the same equipment could not have been used in one case as in the other. The 24-in. belt keeps the batching hoppers filled as well as the wider belt does in the other plant. And the system of handling cement by pumps apparently has advantages.

As regards the design and control of the



Barge leaving wharf at Oakland, Calif., with aggregates for Golden Gate Bridge



mix, the writer does not see how it would be possible to improve very much the system used on the Bay Bridge job. Both the water-cement ratio and the consistency are positively controlled, the first with no variation and the second varying in accordance with the methods of placing, which, as has been shown, vary considerably from the nature of the construction in different parts of the job. And such control demands that the grading should be held within narrow limits. Differences that would not in the least matter where the concrete was being placed with buckets are of importance where the concrete is being pumped through a 6-in. pipe. And where it is being forced to the bottom of a coffer dam through tremie pipes the fluidity of the concrete must be sufficient to insure its spreading to the right distance without its being so sloppy as to invite laitance. And yet the water-cement ratio must be maintained with the same exactness that it is in other parts of the work.

At the same time, the writer does not wish to give the impression that the concrete on one job is any better than the concrete on the other, because this is not true. What is true is that the system of design and con-

trol on the Bay Bridge job is more elaborate because it has to meet a greater variety of conditions.

On both jobs the mix is figured by absolute volume methods and batching is by weights, the weights being fixed by the specific gravity of the materials and correction being made for moisture content. This is so because there is no other way to control yield, consistency and water-cement ratio successfully. On both jobs the mortar has always sufficient density to suspend the coarse aggregate, and on both, the concrete in the forms shows no free water, after it has been vibrated into place.

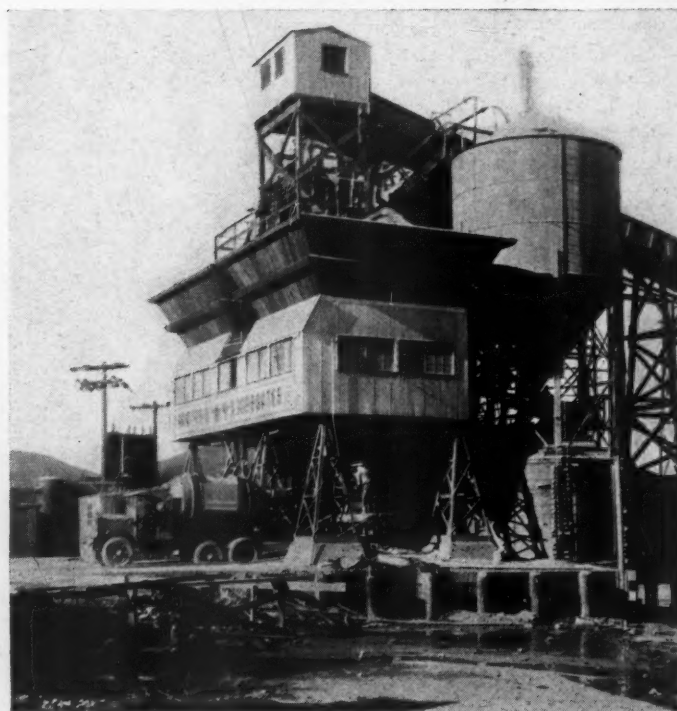
The study of the concrete practice on these jobs, especially the methods used for handling and batching the materials, has been intensely interesting to the writer. He feels that on one job or the other may be found everything that research has shown to be necessary or even advantageous in the design and control of concrete mix.

The Golden Gate Bridge is being built by the Golden Gate Bridge and Highway District, an organization of the counties that will be most benefitted by it.

Pacific Coast Aggregates, Inc., has its office in the Crocker building, San Francisco;

Above: Concrete pier for supporting a tower of the Golden Gate Bridge, and runway for mixer trucks

Right: Aggregate bins in batching plant of Pacific Coast Aggregates, Inc.



the president is Charles M. Cadman. E. B. Kendall, vice-president, is in charge of operations. The entire material handling and batching plant was designed by the operating staff of the Pacific Coast Aggregates, Inc.

Portland Cement Yardage

AWARDS of concrete pavement for March, 1934, are announced by the Portland Cement Association as follows:

	Sq. yd. awarded during March, 1934	Sq. yd. awarded to date, March 31, 1934
Roads	2,142,813	6,629,047
Streets	1,196,679	4,195,845
Alleys	13,750	35,274
Total	3,353,242	10,860,166

Importance of Clean Aggregates

DURING the construction of a storm water conduit at Salt Lake City, Utah, a few loads of gravel, partially coated with clay, were delivered. The gravel was used in the concrete after being partly cleaned by spraying with water from a hose. A 7-day test cylinder from the concrete broke at 1,344 lb. per sq. in. while the average of cylinders, made with clean gravel, was 2,600 lb. per sq. in. at 7 days. The fractured surface of the cylinder with coated gravel showed that the clay prevented normal adhesion of the cement. The mixing time for the concrete was two minutes.

Concrete to Make Buildings Earthquake-Safe

ONE of the biggest jobs coming up on the Pacific Coast is that of making school houses and other public buildings so that the state boards of architects will be satisfied that they will resist any ordinary earthquake shocks. In the city of Los Angeles alone it is estimated that the cost will run to \$31,000,000, of which \$10,000,000 is available for immediate use. Work now in hand or expected to be begun shortly will call for 200,000 bbl. of cement and at least three times and probably four times as much will be needed for the complete program, for it is found that more and more dependence has to be placed on reinforced concrete to secure the necessary rigidity and strength most economically. In Los Angeles alone there are 767 school buildings to be reconstructed and as many more in southern California outside of the city. The total cost may exceed \$60,000,000.

Present intentions are to use existing walls, roofs and floors so far as possible. The method of doing this by placing reinforced-concrete frames in channels chased out of brick walls has been developed so far that it may be said to be standardized. In some cases it is proposed to use steel beams covered with gunite instead of reinforced concrete, but the effect is the same. But this is not thought to be sufficient in some cases

and an outer shell of reinforced concrete to cover the brick has been designed, and where the cost of this approaches the cost of a new reinforced-concrete wall, the new wall will be built. In one case where there are strong reasons for preserving the outer walls it is proposed to strengthen them from within, replacing two or three interior courses of brick with reinforced concrete and adding a concrete frame.

Since every sort of bearing condition from solid rock to marshland may be found within the limits of the city, the structure must be adapted to what the earth will support. Where one new structure is to be erected, it was found that the earth would support no more than 750 lb. per sq. ft., and a special design was worked out. This has a frame of light steel, of Z-bar and similar sections, which will support walls of gunite, 2 in. to 2½ in. thick.

The program might be summed up by saying that it is largely a matter of replacing other materials with plain and reinforced concrete. And the conviction is strong that if conservatism had not dictated the use of other materials in the beginning, and often against the judgment of good architects and engineers, the original cost of the buildings would have been less and the cost of reconstruction would have been largely avoided.

Sand-Lime Brick Production and Shipments in March, 1934

THE following data are compiled from reports received direct from producers of sand-lime brick located in various parts of the United States and Canada. The accompanying statistics may be regarded as representative of the industry.

Eight sand-lime brick plants reported for the month of March, this number being two less than the number reporting for the month of February, 1934, statistics for which were published March 25:

Average Prices for March

Shipping point	Plant price	Delivered
Saginaw, Mich.	\$10.00	\$12.00
Grand Rapids, Mich.	16.00	20.00
Syracuse, N. Y.	8.50	13.50
Mishawaka, Ind.	12.00	
Toronto, Ont., Can.		

Statistics for February and March

	†February	*March
Production	358,800	562,975
Shipments (rail)	54,000	126,000
Shipments (truck)	365,840	721,011
Stocks on hand	2,042,173	1,755,093
Unfilled orders	900,000	355,000
†Ten plants reporting; incomplete, four not reporting unfilled orders.		
*Eight plants reporting; incomplete, three not reporting unfilled orders.		

Scaling of Concrete Pavement

THE Bureau of Materials, Illinois State Highway Department, has made a very thorough study of the scaling of concrete highways, with all kinds of data available in regard to character of materials used and conditions under which the construction was done—temperature, time of day, etc.

From the studies, the tentative theory is advanced that the immediate cause of scaling is crystal growth. The slab consists of the concrete covered with a thin layer of relatively porous mortar of inferior strength, which in turn is covered with a relatively impervious film of neat cement. Under certain favorable conditions, dissolved salts are carried to the surface mortar and deposited at planes of cleavage or lamination. Some of the more important factors seem to be climatic conditions, kind of cement, time of day when laid. Brooming, when properly done, seems to be effective in preventing light scale but may not prevent medium and heavy scale.

The yardage of pavement actually scaled in Illinois is very small, 0.43%, and probably does not affect the structural life of the pavement. However, the problem becomes serious in some sections where heavy scale occurs, principally because of its effect on the appearance.

The theory has been advanced before that scaling of concrete pavements is caused by the SO₂ and other acids in rain water, especially in and around industrial sections. Obviously the chemical characters of both cement and aggregates would have their effects in this case.

Lime as an Enamel Raw Material

UNDER the above title *Ceramic Industry* prints a translation of an article in German by Dr. Richard Aldinger, a ceramic expert. After exploding a long held theory that lime is harmful, Dr. Aldinger makes the following conclusion:

"On the whole the real field for lime lies mostly in enamels capable of resisting water, acids, lye, and strong alkalies and for the highly acid-resisting enamels for chemical ware. Since the expansion coefficient of the iron-enamel must be kept within narrow limits and since it is therefore often difficult to obtain the necessary expansion for resistant enamel without reducing the resistance by the introduction of too much alkali, lime should be considered as a material well adapted to increase the expansion coefficient.

"Speaking from years of practical experience it may be stated that lime used in ground coats up to 10% and in cover coats from 6 up to 8%, is a valuable enamel raw material. Neither in ground coats nor in cover coats could delayed influences of the lime be determined. As mentioned above lime exercises a favorable effect on the opacity of the enamel. Lime enamels are more opaque than enamels without lime.

Production of phosphate rock for the 12-month period ending November 30, 1933, according to the latest data based on the U. S. Bureau of Mines statistics, is estimated at about 2,379,000 long tons, compared with 1,663,000 tons for 12-month period ending November 30, 1932.

Adjusting Production to Probable Demand

Trade Trends in the Lime Industry

ROCK PRODUCTS has long advocated the collection and use of statistics upon which accurate estimates of a season's business might be based. Producers in this industry will recall that so-called overproduction or overcapacity made itself evident long before 1929. From 1927 to 1929 they had experienced a period referred to then as "profitless prosperity." In ROCK PRODUCTS, December 22, 1928, was an editorial article, "Market Analysis and Budgeting Production and Sales." This was followed in 1930 by a series of three editorial articles on "Your 1930 Business; Where Is It Coming From; and How?" In these articles was recommended collection and analysis of statistical data from which it would be possible to predict consumption of rock products months in advance. Then producers could adjust their operations to produce at 50% capacity, or what have you, efficiently and profitably, instead of proceeding blindly as most of them did (and still do). In the preparation of these articles the editor had the generous cooperation of many leaders in the industry.

The editor likes to refer back to these articles because much that was suggested then is now about to be accomplished under NRA. Of course, ROCK PRODUCTS does not take any particular credit for the trend of events toward "planning" industry, which is now the major issue before the country, for the minds of all producers were being directed in that direction as far back as 1928. For years before that W. S. Mallory of New York City had been analyzing statistics of projected construction and converting them into barrels of cement to be consumed, so that it was possible to know very accurately in each cement producing district what percentage of its capacity would be utilized. ROCK PRODUCTS pointed out the possibility of doing the same thing for other rock products, although the process would not be so simple because of the many other industries than construction which were involved.

Lime Statistics

A splendid example of the analysis of statistics to show how, when and where the demand for lime comes has just been issued by the U. S. Bureau of Mines. It is entitled, "Trade Trends in the Lime Industry," R. I. 3227, March, 1934, by Paul Hatmaker, formerly with the building materials section of the Bureau of Mines, now statistician with the National Lime Association. While this analysis is all of the past, it is obvious that the same method could be applied to predicting the demand for lime months in advance. Since 1929 many more statistics are available to help not only the lime industry, but every industry, plan orderly production,

so that there may be efficiency and profit in part-capacity operation as well as in full-capacity operation. All that is wanted in most industries is some one familiar with sources of such statistics and capable of analyzing them.

Lime, of course, has many outlets besides construction, so that all things considered, the average annual production and sales have varied less from year to year than almost any other material used in construction. The accompanying Table 1 is interesting in showing how relatively stable certain markets for lime really are:

These are the "non-durable" or "consumer

goods" markets, which account roughly for one-half to one-third of the total sales of lime.

The "durable" or "capital goods" markets, depending largely on construction, are much more fluctuating, as is shown in Table 2.

The Census of Construction, made in 1929, by the U. S. Bureau of the Census, but published only within the last year or two, supplies statistics from which the part of the construction dollar that goes to lime, cement, sand and gravel, etc., may be readily determined. Of course, these percentages may change from year to year as the character of construction changes, and the relative

TABLE 1.—LIME SOLD BY PRODUCERS IN THE UNITED STATES, 1912-1933, BY MAJOR USES.
(All quantities in short tons.)

Year	Agriculture	Paper mills	Water purification	Tanneries	Sugar refineries	Total sold for "non-durable" uses	Total accounted for by major uses	Total not so accounted for
1912	604,607	290,347	.....	40,595	30,988	.....	2,522,983	1,006,479
1913	590,229	284,090	.....	49,591	32,236	.....	2,314,245	1,281,145
1914	684,348	242,998	.....	49,393	31,931	.....	2,172,103	1,208,825
1915	673,260	216,819	.....	47,104	34,025	.....	2,120,941	1,501,869
1916	613,527	353,187	.....	59,919	21,923	.....	2,738,542	1,334,891
1917	488,297	355,768	.....	66,629	47,546	.....	2,542,333	1,244,031
1918	391,047	325,172	.....	74,350	36,494	.....	2,355,391	850,625
1919	438,632	335,813	.....	59,978	13,111	.....	2,606,340	724,007
1920	351,851	365,897	90,533	61,162	14,145	883,588	2,924,481	645,660
1921	284,722	235,855	74,201	47,841	12,225	654,844	2,215,554	316,599
1922	272,726	310,229	87,432	42,978	16,393	729,758	3,215,402	424,215
1923	240,551	311,309	92,406	53,906	13,044	711,216	3,667,207	409,036
1924	248,336	300,101	113,577	53,349	17,061	732,424	3,666,967	405,033
1925	298,976	376,670	115,776	62,933	19,089	873,444	4,162,203	418,620
1926	297,010	423,322	139,478	66,536	15,379	941,725	4,181,081	379,317
1927	322,893	429,606	124,212	63,666	16,086	956,463	4,007,839	407,093
1928	333,910	429,334	145,757	64,464	22,678	996,143	4,059,305	399,107
1929	338,329	411,017	156,117	67,046	20,758	993,267	3,818,437	451,331
1930	343,111	378,721	161,805	56,526	18,905	959,068	3,023,032	364,348
1931	297,312	286,745	160,384	54,604	18,185	817,230	2,375,114	332,500
1932	244,574	259,418	142,594	45,943	22,628	715,157	1,682,899	277,091
1933	231,000	.....	.....	.....	.....	.....	.....	.....

TABLE 2.—LIME SOLD BY PRODUCERS IN THE UNITED STATES, 1912-1933, BY MAJOR USES.
(All quantities in short tons.)

Year	Total (quick and hydrated)	Total hydrated	Building ¹	Metal-lurgy	Re-fractory	Glass works	Sand lime and slag brick	Total sold for "durable" uses
1912	3,529,462	416,890	1,556,466	.....	.....	.....	.....	.....
1913	3,595,390	493,269	1,358,099	.....	.....	.....	.....	.....
1914	3,380,928	515,121	1,163,433	.....	.....	.....	.....	.....
1915	3,622,810	581,114	1,149,733	.....	.....	.....	.....	.....
1916	4,073,433	717,382	1,509,968	180,018	.....	.....	.....	.....
1917	3,786,364	709,157	1,313,493	209,976	.....	60,624	.....	.....
1918	3,206,016	620,216	914,186	253,778	318,896	34,051	7,417	.....
1919	3,330,347	777,408	1,191,434	295,622	222,036	44,618	5,096	.....
1920	3,570,141	853,116	1,305,412	344,921	316,293	54,747	19,520	2,040,893
1921	2,532,153	792,970	1,239,486	164,245	107,664	43,851	5,464	1,560,710
1922	3,639,617	1,106,063	1,845,208	200,799	348,838	62,187	28,612	2,485,644
1923	4,076,243	1,225,928	2,131,533	373,020	357,642	78,942	14,854	2,955,991
1924	4,072,000	1,316,664	2,169,700	336,813	328,659	72,822	26,549	2,934,543
1925	4,580,823	1,560,848	2,387,267	411,190	392,147	73,011	25,144	3,288,759
1926	4,560,398	1,606,811	2,320,323	408,234	386,715	84,263	39,821	3,239,356
1927	4,414,932	1,596,906	2,148,840	406,063	374,415	78,994	43,064	3,051,376
1928	4,458,412	1,612,818	1,986,465	504,248	448,761	76,161	47,527	3,063,162
1929	4,269,768	1,550,771	1,640,827	578,488	488,032	75,283	42,540	2,825,170
1930	3,387,880	1,329,562	1,204,614	415,692	351,740	62,912	29,506	2,064,464
1931	2,707,614	1,119,266	947,085	290,352	243,769	59,148	17,530	1,557,884
1932	1,959,990	852,251	596,825	170,518	135,733	51,142	13,524	967,742
1933	2,224,000	822,000	507,000	.....	252,000	.....	.....	.....

¹Quantities listed under the several uses include both quick and hydrated lime.

²Estimated figures for 1933.

prices of competitive commodities change, as the relative sales activities of the various industries change, etc. But the method of analysis would be the same in predicting in advance the probable demand, taking all these factors into consideration. For example, Table 3, from Mr. Hatmaker's analysis gives these data for the year 1929:

These, of course, are the costs of building materials on the job, including freight charges, distribution costs, etc.

Similar analyses are made, or could be made, of the consumption of lime in the iron and steel industry, paper industry, etc.

Mr. Hatmaker's report contains a great deal more than is outlined here, and Rock PRODUCTS thoroughly agrees with his conclusions:

"The analysis of sales of lime, although incomplete, is believed to be the first attempt at correlation of the many business data on current markets for this commodity. More information would be desirable on monthly shipments of the various kinds of lime as well as on current consumption in the several consuming districts by uses. Inasmuch as the importance of economic studies of nonmetallic commodities is slowly beginning to be realized the need for more and better data is appreciated, and such statistics may be available in the future. The day is rapidly passing when the state of current business will be appraised merely by opinions, without concrete factual and statistical foundation.

"Business statistics are more than mere recitation of history. Many executives find it desirable to check their own production and sales against the performance of the entire industry, both as to output and price. Often weak spots can thereby be detected and corrected before serious damage results. Knowledge of conditions in the consuming industries is essential to intelligent sales programs; it may be much more important in the future than it has been in the past. Those who contemplate building new plants or expanding old ones likewise need data to show whether adequate markets can be found for the proposed products."

Lime for Sewage Treatment Highly Praised

RESULTS of some preliminary investigations made in the main laboratory of the Sanitary District of Chicago, Ill., on "Prefiltration Treatment of Sewage Sludge" are described in the February issue of *Industrial and Engineering Chemistry*, by F. W. Mohlman and G. P. Edwards. Various chemical and filter aids were used to condition sludge prior to filtration. A large number of such filter aids were tested for comparative data on rates of filtration through Büchner filters. The materials used were compared as to rates of filtration, economy and practicability when used with various types of sludges, both undigested and digested.

With reference to the use of lime the authors state "A number of tests made early in 1932 indicated that, for digested sludge, a great saving in ferric chloride could be obtained by use of lime, following treatment with relatively small amounts of ferric chloride. The results indicated that small amounts of lime (5% or less), added after addition of ferric chloride, did not cause a marked improvement in filtration, but, when

sufficient lime was added to bring the pH up to 9.0 or more, a great increase in rate of filtration was noted.

"Tests shown in Table VI were made in 1933 by G. G. Poindexter on West Side Imhoff sludge. The improvement shown by use of lime is remarkable. With ferric chloride alone the most rapid filtration occurred at a pH of 4.4, with 9.07% ferric chloride. The time for collection of 150 cc. of filtrate was 282 seconds. The lowest amount of ferric chloride used, 4.18%, required 480 seconds. However, using this lowest amount of ferric chloride and lime, increasing from 3.2 to 19.3%, the time of filtration was rapidly reduced, with a minimum time of only 120 seconds when 16.1% lime had been applied. Even with as little as 6.45% lime (following ferric chloride) the time of collection of 150 cc. was only 210 seconds, well below the minimum time with the optimum amount of ferric chloride alone. The differences are even more striking when based on the time that elapsed before the cake broke away from the funnel.

"Lime is much cheaper than ferric chloride; consequently, substitution of lime for ferric chloride will result in a substantial

TABLE VI. FILTRATION OF IMHOFF TANK SLUDGE USING FERRIC CHLORIDE¹ AND LIME AS COAGULANTS AT WEST SIDE TREATMENT WORKS
(Sludge moisture, 93.8 per cent; pH, 6.6; March 22, 1933)

FeCl ₃ as % of Dry Solids	Lime on Dry Basis %	Time for Collecting 150 cc. Filtrate Sec.	Time for Cake to Break from Sides of Funnel Sec.	Filtrate When Cake Broke Cc.	pH of Filtrate
4.18	0	480	1020	186	5.4
5.58	0	405	Not recorded	186	5.4
6.96	0	312	600	185	5.2
8.36	0	285	500	184	4.8
9.06	0	282	520	185	4.4
9.75	0	310	575	187	3.7
4.18	3.22	478	930	185	7.3
4.18	6.45	210	270	170	8.9
4.18	9.68	167	210	165	9.4
4.18	12.8	130	165	165	9.6+
4.18	16.1	120	140	168	9.6+
4.18	19.3	122	140	158	9.6+

¹ The ferric chloride solution was added 10 seconds before the lime was introduced and was mixed in a 600-cc. beaker with a rotary motion. After addition of lime, the sludge was mixed with a spatula for one minute before it was poured on the filter. Hence, the contact period for the ferric chloride was 70 seconds.

TABLE 3.—COST OF MATERIAL REPORTED BY ALL CLASSES OF ESTABLISHMENTS PER \$1,000 CONSTRUCTION WORK DONE.

	United States	New England	Middle Atlantic	East North Central	West North Central	South Atlantic	East South Central	West South Central	Moun- tain	Pacific
Lime	\$1.78	\$2.25	\$1.83	\$1.95	\$1.13	\$2.42	\$1.21	\$1.52	\$1.89	\$1.16
Plaster	4.08	3.35	3.33	5.22	2.88	4.59	5.29	3.63	4.86	4.49
Brick	17.73	18.08	17.17	21.19	15.27	22.40	17.27	16.29	17.29	9.28
Tile, fireproof- ing	3.55	1.90	3.36	5.50	2.95	3.54	1.62	3.14	1.82	1.58
Tile, facing, terra cotta, floor and wall	7.67	6.56	8.14	6.87	6.23	8.09	5.13	7.80	9.01	10.71
Cement	38.34	27.50	29.72	37.27	53.66	48.68	43.76	56.60	38.23	49.91
Sand, gravel, stone, slag, cinders and other aggre- gates	44.79	32.79	33.98	47.37	58.34	59.75	56.17	64.77	36.61	51.12
Concrete and cinder block.	3.15	2.89	3.37	2.92	3.10	5.38	2.10	1.31	1.83	3.21
Cut stone, granite and marble	11.94	10.80	13.93	10.68	10.84	12.29	27.15	12.84	2.42	5.90
Riprap and rubble	1.43	1.43	1.02	1.01	3.25	1.52	4.45	.54	.67	2.08

saving. The remarkable results obtained by use of ferric chloride and lime on digested sludge, with filtration at a pH of 9.0 or more, have not been duplicated on fresh sludge. Apparently the fresh sludge yields best to treatment on the acid side, particularly with addition of an oxidizing agent such as dichromate, while digested sludge filters best on the alkaline side, with addition of ferric chloride followed by lime. Whether or not this difference in behavior is due to differences in charges or the sludge particles has not been investigated. The presence of soluble bicarbonates in the sludge liquor of digested sludge may account, in part at least, for the larger amount of ferric chloride required and may also explain the advantage in adding lime to coagulate a colloidal iron sol which otherwise will not flocculate."

Balancing Equipment in Crushed Stone Quarries

By W. E. Farrell*

THIS ANALYSIS of the productive capacity of the three controlling units in quarries producing crushed stone, was largely prompted by the admission of a large producer. His company operated at that time only one quarry, but it was producing about 600,000 tons of stone annually.

The question of shovel, transportation and crusher output arose, and how his results compared with those of other quarries. "After fifteen years of operation," he said, "frankly, I do not know. I have been asked before about the efficiency of my equipment, but I have no data with which to make comparisons."

This situation must be quite common when, in an industry which has produced 90,000,000 tons annually, half of this output is produced by 5% of the companies engaged therein.

A few companies do operate two or more quarries. These do, or at least should, have comparable data with which they can demand better results from the poorer operations. The large majority of operations, however, can only compare gross sales from year to year. An increase in annual sales implies progress, but there is no assurance that there has been any increased efficiency in the absence of a "yard stick" with which to measure.

Manufacturers' catalogues are of little help. Those on "Shovels" and "Transportation" say nothing as to output. Their salesmen can, without doubt, supply this deficiency. Catalogues of crushers give tables of tonnages, but they do not all agree; they could not be expected to. The values given in these catalogues are stated to be "Conservative," or "Approximate" only. They depend on operating conditions: whether the stone breaks hard, or easily; is wet or dry; clean or dirty, etc. Their claims are also modified by the character and efficiency of the transportation equipment, and whether the feed be continuous or intermittent.

Improvement in existing operations and possibly the establishment of standards of efficiency do seem possible if a start is made with such data as are available, to be followed by closer coöperation between the operators and the manufacturers of quarry equipment.

Much of the present inefficiency, where it exists, can be attributed to an unbalanced plant. A shovel with a dipper too large, or too small, for the crusher; a dipper of proper size, but too few shovels to equal the crusher capacity; hauling equipment inadequate as to kind, size or quantity. Any of these conditions may exist through economies, expansions or other circumstances not chargeable to administration.

A birdseye view of the present situation,

*President, Easton Car and Construction Co., Easton, Penn.

Editor's Note

THE SUBJECT of this article has been a hobby and a conscientious pursuit with Mr. Farrell for several years. He has spent weeks and months without number visiting quarries, studying their operation with a stop watch. He has analyzed published reports of quarry operation with more interest and more acumen than any one we know.

The result is that there is an enormous amount of "meat" here, crowded into a few brief paragraphs. The reader will need to read and reread and study this article thoroughly to get the full advantage of it. Undoubtedly it is the most thorough analysis of quarry operation ever made.

—The Editor.

as between crusher and shovel equipment, is presented in Tables 1 and 2. These are not long lists, but duplications have been avoided; and, after all, there are not so many records extant.

The setting of the crusher was known in only a few cases, and without this infor-

SHOVELS IN RELATION TO JAW CRUSHERS

Crusher Size	Number of Shovels	Capacity of Dipper in Cubic Yards
35 in.	1	¾; 1.
	3	1.
42 in.	1	½; ¾.
	2	1 & 2; 1¼ & 2.
48 in.	1	1; 1¾; 2; 2½; 3.
	2	1½; 1¾; 2 & 2½; 2¾ & 3.
54 in.	2	¾; 1¾.
	3	1¾.
60 in.	1	1¾; 2; 2½; 3; 4.
	2	1½; 2; 2¼; 2½; 3.
	2	1 & 1½; 1½ & 2; 2 & 2½; 2¼ & 2½; 2½ & 3.
	3	2½; 3 & 3½.
84 in.	1	3; 4.
	2	4; 5.

SHOVELS IN RELATION TO GYRATORY CRUSHERS

Crusher Size	Number of Shovels	Capacity of Dipper in Cubic Yards
14 in.	1	¾; 1; 1¼.
16 in.	1	¾; 1; 1¼; 1½.
20 in.	1	1¼; 2.
	2	2½.
	2	1¼; 2½.
26 in.	1	1¼; 1¾; 2½; 3.
	2	1¼; 4.
	2	1; 3.
30 in.	1	1¼; 1½; 1¾; 2½.
	2	1½; 2½.
36 in.	1	¾; ¾; 2.
	2	1; 2; 3.
	2	1 & 2½.
	3	1½.
42 in.	1	1¾; 2¼; 2½; 3; 3½; 4; 5.
	2	1½ & 2; 1½ & 5; 2 & 3.
	3	1½; 2 & 3; 2; 3 & 3½.
	4	3; 2 & 1; 3.

mation no particular combination of crusher and shovel can be criticized. It is evident, however, that there is much maladjustment between shovel and crusher capacity, as well as the dipper size in relation to the crusher (considering the dipper as an instrument to measure the proper size stone for the crusher). This is evident when one considers a large size crusher—say 60-in. In five operations having a 60-in. jaw crusher, as the Table 1 shows, and using only one shovel, this shovel varied in dipper capacity all the way from 1 cu. yd. to 4 cu. yd., and in a similar operation using three shovels, all were over 2½ cu. yd. Similar tables pertaining to the transportation equipment would show the same unbalanced condition, if such data were available.

Crushers

Under this head, only the primary crusher is considered, since its capacity and setting determine both the preceding and succeeding equipment.

The productive ability of crushers is given in various catalogues, subject to numerous conditions as noted before. Charts 1 and 2 show graphically the crusher output in tons per hour as recorded in the catalogues of several manufacturers.† While uniformity is not to be expected—as each of the makers, no doubt, has his own method of rating the crushers—there is a very definite trend toward uniformity.

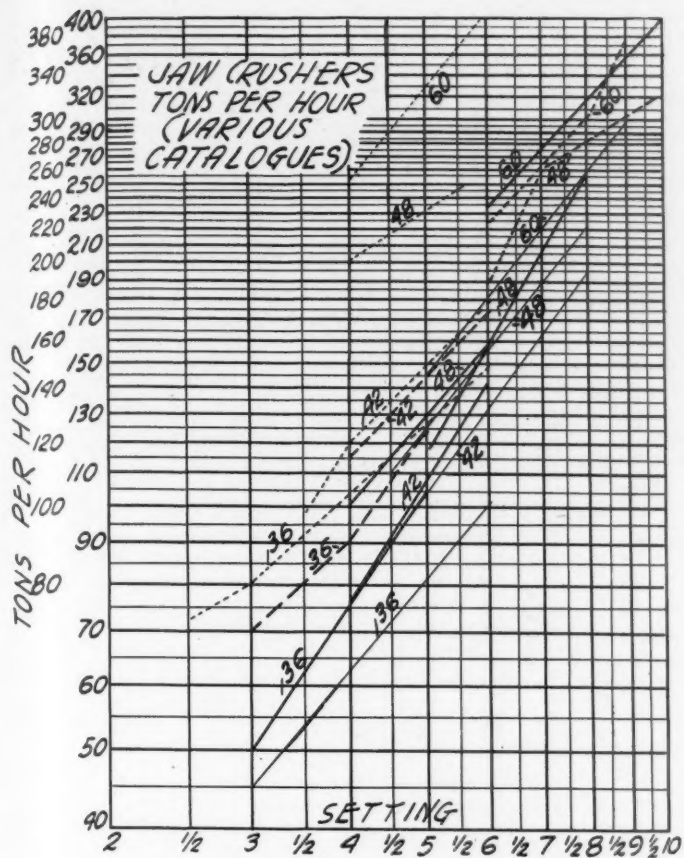
To render the combined opinion of the several manufacturers applicable to any make and size of crusher Charts 3 and 4 were drawn, based on a fair average of the manufacturers' statements of expected production. It is believed that the outputs indicated in these charts are capable of attainment in any quarry, subject only to changes in other equipment; during a test or for a limited period results greater by 40% or even 50% might be attained.

Chart 5 is inserted here for those who desire to continue further this study of jaw crusher output as given in catalogues.

In this chart the tons per hour is for all makes and sizes of crushers reduced to a true basis of comparison, namely, the tons per hour per foot of width of opening. The first figure along each line designates the width of the crusher and the second figure the r.p.m. of the driving pulley.

Many records of crusher output are little better than guesses. It is difficult if not impossible to measure. "Output" in most reported cases, consists at its best of tons sold, plus inventory "estimated." On the contrary, "Input" if recorded or measured, is easily determined, either from the number

†The figures above the lines designate the width of the crusher openings; for jaw crushers 36 in. x 48 in., 48 in. is the width of opening, for gyratory 30 in. x 90 in., 30 in. is the width of opening.



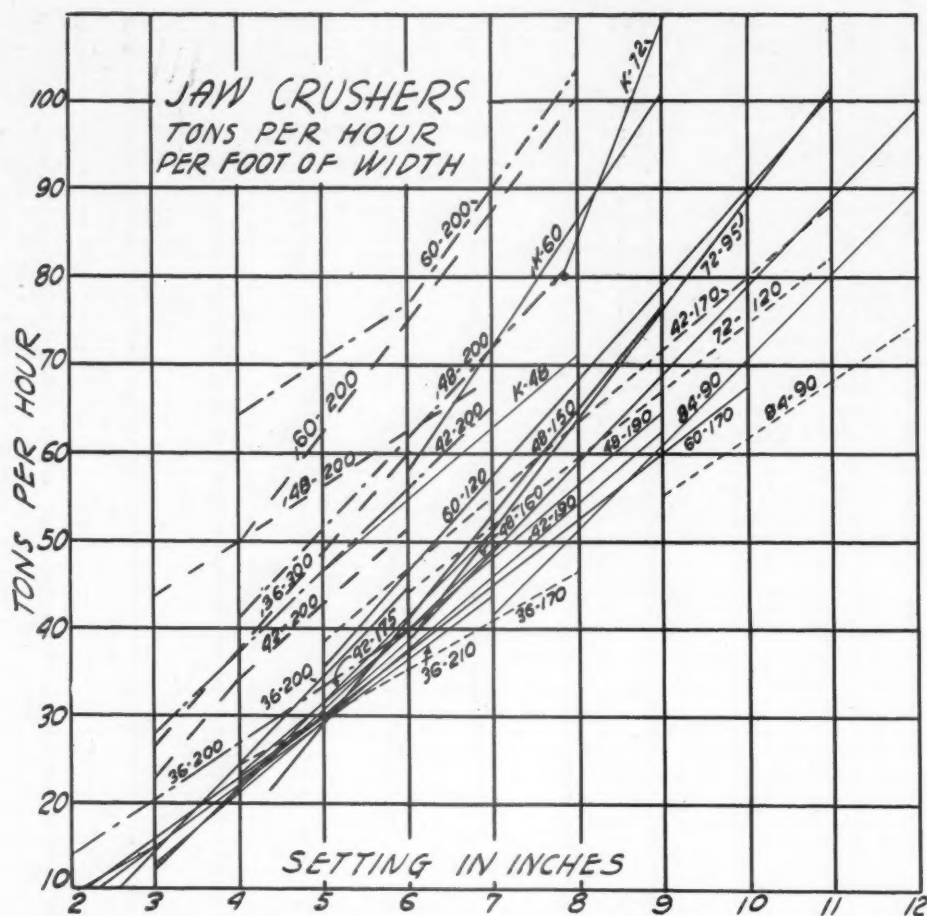


Chart 5—Jaw crusher outputs reduced to a basis of tons per foot of width

of car or truck bodies dumped; or, better yet, from the number of shovel-dippers' full. Incidentally, the keeping of such records would inevitably lead to an increased efficiency in these units.

Shovels

The shovel, as far as its dipper is concerned, bears a dual relation to the primary crusher. Whether one, two, or more shovels are used their combined output in tons per hour should equal the capacity of the primary crusher under the same efficiency rating; and, further, as a measuring unit no stone should pass through the dipper which cannot also enter the crusher.

Before considering the output of shovels, some records of reported shovel output on "attempted" seasonal operation, are given in Table 3.

Any criticism of a particular shovel's output would be unfair without consideration of the human element.

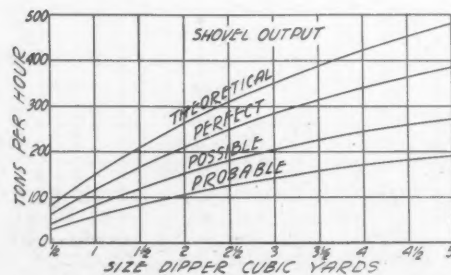


Chart 6—Shovel ratings

Production is dependent upon the operator. A high rate of production is possible only if the operator is physically fit; as this work calls for endurance: he should have the skill of an expert, and be mentally alert; for, the shovel's movements are measured in split seconds, and require instantaneous decisions.

SHOVEL OUTPUT—TONS PER HOUR

Dipper Capacity	Recorded Output in Tons per Hour
3/4	35; 40; 42; 80.
1	45; 50; 54; 63; 75; 85.
1 1/4	20; 57; 75; 90; 100.
1 1/2	74; 90; 95; 109.
1 3/4	52; 67; 80; 83; 85; 86; 96; 99; 100; 103; 105; 110; 111; 130; 150.
2	35; 70; 73; 79; 90; 107; 125; 180; 240.
2 1/2	60; 70; 80; 82; 94; 107; 114; 120; 129; 133.
2 3/4	48; 60; 119.
3	100; 105; 108; 110; 111; 119; 132; 200.
3 1/2	61; 100; 125; 180; 190.
4	85; 168; 236.

The above are taken from printed records or reports from quarries, and represent average tons loaded per hour of "attempted" operation. The variations between shovels with similar size dippers seem unreasonably excessive. It is not contended that in every quarry a shovel with a 2-yd. dipper should load 150 tons per hour, say, but if the other equipment limits the output to 70 tons per

hour, and their efficiency cannot be improved, a smaller shovel could be used.

A theoretical "dipper cycle" may be defined as the time interval between the dropping of one dipper load and the next, into the body of the hauling unit, when no time is lost in filling the dipper, casting, moving up, etc., etc.

A tabulation of hundreds of such intervals taken from shovels of various types does not show, when averaged, any positive distinction as between types of shovels; and only minor variations on the basis of dipper capacity, within the usual quarry ranges. As table 5 indicates there is a great range of efficiency as between quarries, so great it cannot be wholly attributed to the blasting method or fracture of the stone.

Three degrees of operating efficiency are assigned to the shovel (and crusher also) to cover any possible effect of operating obstacles, not one of which, however, is beyond the range of attainment in any quarry:

Rating *A* is known as "Perfect"; these are results which are possible over a limited period; say an hour, day, or even a week.

Rating *B*, called "Possible," indicates what the unit could reasonably be expected to produce throughout the season per hour of "attempted" operation.

Rating *C* is called "Probable," because it is the output that should reasonably be expected per hour of attempted operation under almost any conditions.

The shovel ratings are clearly indicated on Chart 6. The highest rating designated as "Theoretical" is what the name implies, but not impossible of attainment in a test over a short period of an hour or so.

The shape of a dipper suitable for quarrying is not cubical, but for the purpose of this study it is assumed to be such in calculating the proper size to be in balance with the crusher, considered as to the size of stone to be loaded.

There may be good reasons for criticizing or not adhering to the data given in Tables 4 and 5, but it can be said in their favor that they represent units balanced within the province of this study.

Transportation

There is no information available from which to determine either the capacity or number of hauling units to balance the shovel or crusher.

The operator has been the sole arbiter of not only the type of such equipment, but to his whim, or from past experience or observation he has specified his requirements. The result is that every conceivable kind of equipment is in use, from two-wheeled carts drawn by oxen to large motorized cars.

The selection of proper equipment to balance or dove-tail properly with the balanced shovel and crusher is both an art and a science. An art as to type and construction, and a science as to capacity and quantity. This discussion pertains only to the science of the selection.

As to quantity, there should never be less

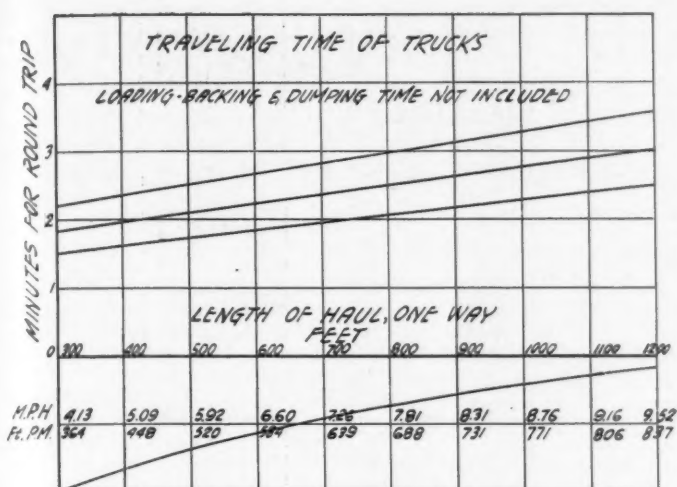


Chart 7—For determining time required for truck hauls of various distances between quarry face and crushing plant

than two units, and in capacity, the body, whether there be one or more to a unit, should be able to hold not less than two dippers full.

A "unit of transportation" may be a single car or truck, or it may be a train composed of several cars.

A "unit transportation cycle" is the time interval between the dropping of the first dipper full into an empty body until this operation is repeated in the same empty body. Whether for a truck or a train, it consists of the sum of several parts; the time required for the shovel to load the unit; the time traveling to the crusher, the time to dump the stone into the crusher and return to the shovel, and any backing at the shovel or crusher, plus any lost or unaccounted for time. These unit cycles determine how many trips the transportation unit can make in an hour or a day.

The choice of the proper hauling unit becomes a matter of selection from several calculable suppositions. Obviously, if two hauling units and one shovel are used, each unit must be of such size that the time to load it is equal to the balance of the "unit transportation cycle."

For simplicity's sake, take trucks by way of illustration. Assume the length of haul each way to be 700 ft., or 1400 ft. round trip. Assume, also, that a shovel with a 2-cu. yd. dipper has been selected as being in balance with the crusher.

By referring to the truck transportation Chart 7, the traveling time is found for "good" practice to be 1 min. 57 sec. The

SHOVEL AND CRUSHER BALANCED (JAW CRUSHERS)									
Setting in Inches									
Width of Crusher	2	3	4	5	6	7	8	9	
Setting in Inches	Dipper Capacity—Cubic Yards								
	One Shovel				Two Shovels				
36	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2
42
48
54
60
72

SHOVEL AND CRUSHER BALANCED (GYRATORY CRUSHER)									
Setting in Inches									
Width of Crusher	3	3 1/2	4	4 1/2	5	5 1/2	6	6 1/2	7
Setting in Inches	Dipper Capacity—Cubic Yards								
	Two Shovels				Three Shovels				
14	1/2	3/4	1	1 1/4	1 1/2	1 3/4	2	2 1/4	2 1/2
16
20
26
30
36
42

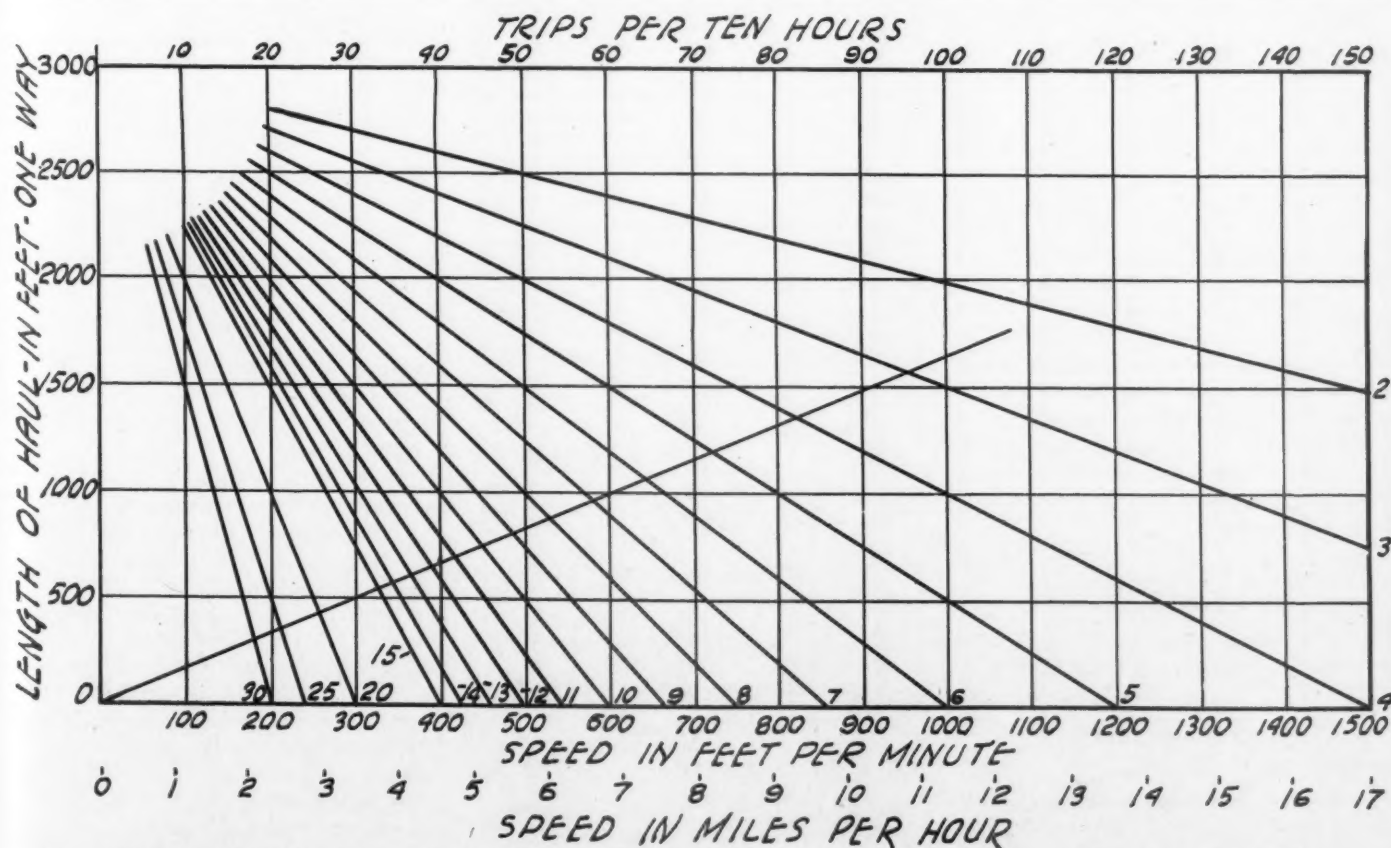


Chart 8—Chart for determining the "standstill" time in quarry hauling operations—seldom less than 20%

result of numerous time studies shows that the average truck will discharge its load in 40 sec.; an allowance of 40 sec. is made for backing either at the shovel or the crusher. The sum of these periods, or 3 min., 17 sec., will be the loading time if two trucks are to be used. By reference to Chart 5 and line marked "theoretical," it is found that in this time a 2-cu. yd. dipper can load 14½ tons. Hence the body should be of this capacity.

In a like manner, if three trucks of 7-ton capacity are used, the "probable" truck cycle will be 12 min. and 20 sec. A season's average cycle of 8 min. and 38 sec. is "possible," and over a short period of a day, week or perhaps even a month, a "perfect" hourly output of 71 tons, for each of the three trucks, is not beyond expectation.

Under certain conditions three trucks may be served advantageously by two shovels; in a very successful operation nine trucks are being served by three shovels.

If the haulage should be by trains of cars instead of trucks the same method of calculation is applicable with proper correction in the time units.

Predetermined standards of transportation efficiency cannot be established as in the case of crushers and shovels; each operation has its own peculiarities.

It is, however, possible to measure the efficiency of the transportation equipment in any quarry. For this purpose the phrase "stand still" time has been devised. "Stand still" time includes all the time of each "transportation cycle" that the unit is not actually engaged in traveling from the shovel to the crusher and returning. It is composed of the loading, dumping, backing, and all lost or unaccounted for time.

The "stand still" time in any quarry can be quickly determined from Chart 8. This chart bears an example of how it is to be used. This chart was made to emphasize to operators the lost or unaccounted for hours per day by the transportation unit. In few quarries is it less than 20% of the total time of attempted operation.

This analysis of the operation of the crusher, shovel and transportation, offers a suggestion for determining the actual capacity of a plant; or, what it could produce in one hour with each unit functioning perfectly. It offers a method of relating the actual capacities of the quarries constituting a group. It could serve to indicate in any plant which member of this triad is controlling the output.

The Code of Fair Competition of the Crushed Stone, Sand and Gravel, and Slag Industries emphasizes efficiency, but whether Codes live or die, the ultimate purpose of quarrying is the gain, and not the glory.

Soil Stabilization

THE COLUMBIA Alkali Corp., Barberton, Ohio, has issued a 12-page booklet on use of calcium chloride for highway surfaces.

Code of the Talc and Soapstone Industry

Contains Up-to-Date Open-Price Selling Provisions

THE Code of Fair Competition for the Talc and Soapstone Industry was signed by National Recovery Administrator Johnson on March 21 and became effective April 1. This code is briefer than most of them, and is of particular interest because the open-price plan written into it was approved after all the recent agitation in Washington over open-price plans in general.

Those provisions on prices are given in full as follows:

Article VII, SECTION 1. *Price Schedule.*—(a) Each member of the Industry within twenty days after the effective date of this Code shall file with the Code Authority the price or prices and terms and conditions of sale at which he is offering his products for sale, which products are in direct or indirect competition with other members of the Industry; this original filing to become effective on the date of such filing. The Code Authority forthwith on such original filing shall notify all known members of the Industry of the contents thereof and shall make the same available to the trade. Any member of the Industry desiring to change the price or prices of his products and terms and conditions of sale shall notify the Code Authority of such intention by filing his revised schedule, which shall become effective immediately thereafter and shall be distributed to the known members of the Industry and be made available to the trade.

(b) Such price schedules shall include terms of payment, length of bookings, or contracts and f.o.b. point of origin and such other provisions as may be necessary to fully inform the trade of all conditions of sale.

(c) The Code Authority shall prescribe rules and regulations providing for the sale of distress merchandise, surplus inventories, products not up to specification, and to meet the competition of other materials competitive with the products of this Industry, which shall become effective upon approval by the Administrator. No member of the Industry shall sell any goods of any of the classes above described for the purpose of violating the provisions of this Code or of defeating the purposes of the Act, except in full compliance with such rules and regulations.

SECTION 2. *Trade Practice Rules.*—The following trade practices are declared to constitute methods of unfair competition between members of the Industry, and no member of the Industry shall use or engage in any of them, directly or indirectly, through any officer, agent, or employee. Engaging in any one of such trade practices or of any other practices which hereafter may be declared to be unfair methods of competition by the Code Authority, approved by the Administrator, shall be deemed a violation of this Code.

(a) Failing to file price schedules or changes therein, as required by Section 1 of this Article.

(b) Selling of any Industry product by a Member of the Industry at a price below the open, filed or publicly announced price schedules of such member, or to deviate from the conditions of sale contained in such schedules filed pursuant to Section 1 of this Article.

(c) Selling products of the Industry below cost of production as determined pursuant to Sub-Section (h) of Section 7 of Article VI

(uniform cost system to be developed and approved); provided, however, that a member of the Industry shall be permitted to file prices and sell at such filed rates in order to meet the filed prices of a competitor, and provided further that sales necessary to meet the competition of other materials with Talc and Soapstone, or sales necessary in order to dispose of distress merchandise, may be made at other than filed prices pursuant to the provisions of Section 1 (c) of this Article VII. Full information concerning such sales shall be reported to the Code Authority and shall be given to all members of the Industry.

(d) Paying or allowing rebates, refunds, commissions, credits or unearned discounts, whether in the form of money or otherwise, or the extension of special services or privileges to certain purchasers which are not extended to all purchasers under similar circumstances, for the purpose or with the effect of violating the provisions of this Code.

(e) Pre-paying freight charges with the intent or effect of granting discriminatory credit allowance.

(f) Allowing in any form, adjustments, discounts, credits or refunds for the purpose or with the effect of altering retroactively the price quoted, in such manner as to create price discrimination.

(g) Pre-dating or post dating any invoice or sales contract, except to conform to a bona fide agreement entered into on the pre-date.

(h) Repudiating a contract entered into in good faith when the purpose or effect of such repudiation is to create an unfair price advantage for a member of the Industry.

(i) Selling through any agent other than an exclusive agent, when an exclusive agency exists, without the consent of such exclusive agent, or selling or attempting to sell through more than one agent, except with the full knowledge of each agent.

(o) Making any contract with a purchaser to protect such purchaser against a decline in price.

The other violations defined are the usual ones.

The Code Authority consists of six members, five voting and one non-voting (the secretary-treasurer of the National Association of Talc and Soapstone Producers, who is also secretary-treasurer of the Code Authority). Two members are elected from the southern zone of producers, two from the northern zone, and one is elected by the entire industry.

The secretary-treasurer of the National Association of Talc and Soapstone Producers is J. B. Aikman, Vermont Talc Co., Chester, Vt. The other members of the Code Authority had not been elected at this writing. The committee which drafted the code consisted of E. W. Magnus, vice-president, Eastern Magnesite Talc Co., Burlington, Vt., chairman; Michael Doyle, president, International Pulp Co., Gouverneur, N. Y., and J. Frazier Glenn, Georgia Talc Co., Asheville, N. C.

The membership of the National Association contains about forty operators. These are located in 12 states.

"Capacity of the Cement Industry"

By W. S. Mallory,
New York City

I HAVE read the article, "Capacity of the Cement Industry," by H. Herbert Hughes, which appeared in your March issue, and I think the conclusions reached therein are very misleading.

It is my understanding that the total productive capacity of the cement industry means the sum total capacity of each of its plants during any recent year and not what each plant has produced in any one year.

The estimate of capacity, which I have compiled and which is used by The Cement Institute, is based on the total of the three highest consecutive months' actual clinker production of each plant, in barrels, dividing this total by the number of calendar days in such three months to obtain the average daily production, and multiplying this average daily production by 365 days to procure the estimated maximum annual capacity. Using this formula for each plant, the total clinker capacity of the industry as of January 1, 1934, based on actual production, is 251,400,000 bbl. The use of three months as a basis of the estimate is to allow for the fluctuations in operation which experience has shown occur over such a period because of repairs and other things that retard production.

Due to the seasonal nature of the cement business, practically all plants reduce the clinker production during the winter months because the shipping demand for cement during that period is less than during the other months of the year; this practice, however, does not affect the total annual clinker capacity of the industry.

August 1928 Not a Record Month

The selection of August, 1928, by Mr. Hughes as the yardstick by which to measure the total capacity of the industry is rather unfortunate as my monthly records of the clinker production of 164 plants in the United States show that only 11 of them had their peak in clinker production during that month. Then, too, while the shipments for 1928, amounting to 175,838,000 bbl., are the record shipments of the industry, the only reason they were not more was because of the lack of a greater demand. At the end of the usual heavy shipping season (October 31 of each year) there still remained in the stockhouses on October 31, 1928, 14,579,000 bbl. of cement and 5,953,000 bbl. of clinker, most of which could have been shipped had the demand existed.

The estimate of 178,515,000 bbl. for eleven months' operation is not correct. In fact, the theory that a cement plant can operate only eleven months is entirely wrong. Many plants during rush periods have operated continuously for two and three years at a

stretch without a month's shutdown; and as against Mr. Hughes' estimate above quoted, by actual production 164 plants have produced 211,739,000 bbl. for twelve months, although operating at reduced schedules during the winter months from November to March. During the six summer months actual clinker production was 122,194,000 bbl. or at the rate of 244,388,000 bbl. per year.

In the "Editor's Note" you refer to "plants more or less permanently abandoned during the past two years." The facts are that during 1932 and 1933, nineteen plants, representing 8.76% of the total capacity and owned by companies having two or more plants, did not produce clinker, the companies preferring to produce clinker and ce-

ment in their other plants or to make shipments from cement stock accumulated before the plants were shut down; of these nineteen plants eight made shipments of cement from their stock during both years. There were also seven individual plants, which represent 3.23% of the total capacity and which did not produce clinker during the past two years, but four of these plants shipped cement from their stock during both years.

With reference to the nineteen plants that did not operate in 1932 or 1933, I know of some companies that operated less efficient plants during those years than others they owned, in order to take care of the local labor at the place where the less efficient plants were located.

The Question of Plant Obsolescence

In some previous editorial which you published, you raised the question of the amount of obsolete capacity in the cement industry. Many cement manufacturers might agree with you that there is obsolete capacity in the cement industry, but how can this be determined? The fact that a manufacturer is willing to continue a factory on his books and pay taxes thereon, would appear sufficient proof to show that he at least believes that his plant is not obsolete and that under normal conditions he could afford to and would operate. There seems to be an open season for the use of the word obsolete in articles appearing in the press. Manufacturers generally are prone to apply it to the other fellow's properties however. After all, is not the question of obsolescence one for self-determination? At least, I know of no way in which a yardstick could be applied that would force anyone owning a plant to admit that it was obsolete if they in their opinion believe it otherwise.

* * * * *

Since the foregoing was written I have worked out an estimate of clinker production on the basis of the peak month of each plant which I multiplied by twelve. The result is an estimate of 270,120,000 bbl.

Capacity, estimate based on three highest consecutive months' actual production...251,400,000 bbl.
Actual clinker production, peak year of each plant.....211,739,000 bbl.
Actual clinker production for six summer months was 122,194,000 barrels or at the rate per year of.....244,388,000 bbl.
If the actual peak month of clinker production of each plant is multiplied by 12 (months), the rate per year is270,120,000 bbl.

Editor's Note

THE Author, W. S. Mallory, as every cement manufacturer knows, has devoted many years to the study, analysis and interpretation of statistics of portland cement production and shipment. He describes here how he arrived at the figure for capacity of the industry used by The Cement Institute in its code work.

As to the problem of obsolescence in the cement industry, of course every manufacturer is the judge of his own operation, and obviously other factors than age are involved. In this industry capital costs, as distinguished from direct or manufacturing costs, are relatively large. Hence manufacturers are naturally reluctant to make heavy new capital investments; and operators of some of the older plants state that the differential in cost in favor of the newer plants is not anything like what it is generally believed to be.

So long as specifications for a standard product are maintained on a level that all manufacturers can readily meet, and prices are high enough to cover average costs, there certainly is no reason to believe there is much apparent obsolescence in the cement industry. But all manufacturers do not rely on a continuance of such conditions. The day is evidently approaching when the chemical composition of cements will have to be as carefully controlled in the process of manufacture as those of metallurgical products are now. Such developments constantly make for obsolescence, and all operators know that the only safeguard against them is by keeping one's plant continually up to date, if capital is available to do it.

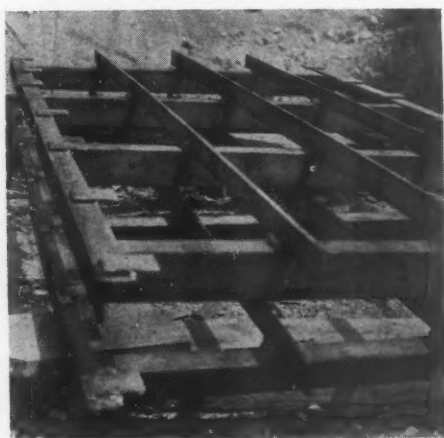
—The EDITOR.



Hints and Helps for Superintendents

Preventing Hook Bolts on Vibrating Screens from Breaking

WHEN the hook bolts fastening the screen wire of a vibrating screen touch the frame of the screen, the continual jar will crystallize them so they break, according to one operator's experience. If the edge of the screen wire can be raised up so that the hooks of the bolts do not



Welded units on screen frame

touch, the trouble can be avoided. One company found an easy way to do this by simply welding small flat pieces to the frame between the points where the hook bolts fastened. These pieces forced the edge of the screen up slightly but just enough so the bolts did not touch the frame. This operator reports that he has had no broken bolts at all since he has fitted all his screens in this fashion.

For Bridged Materials

Ernest Moyer
Alturas, Calif.

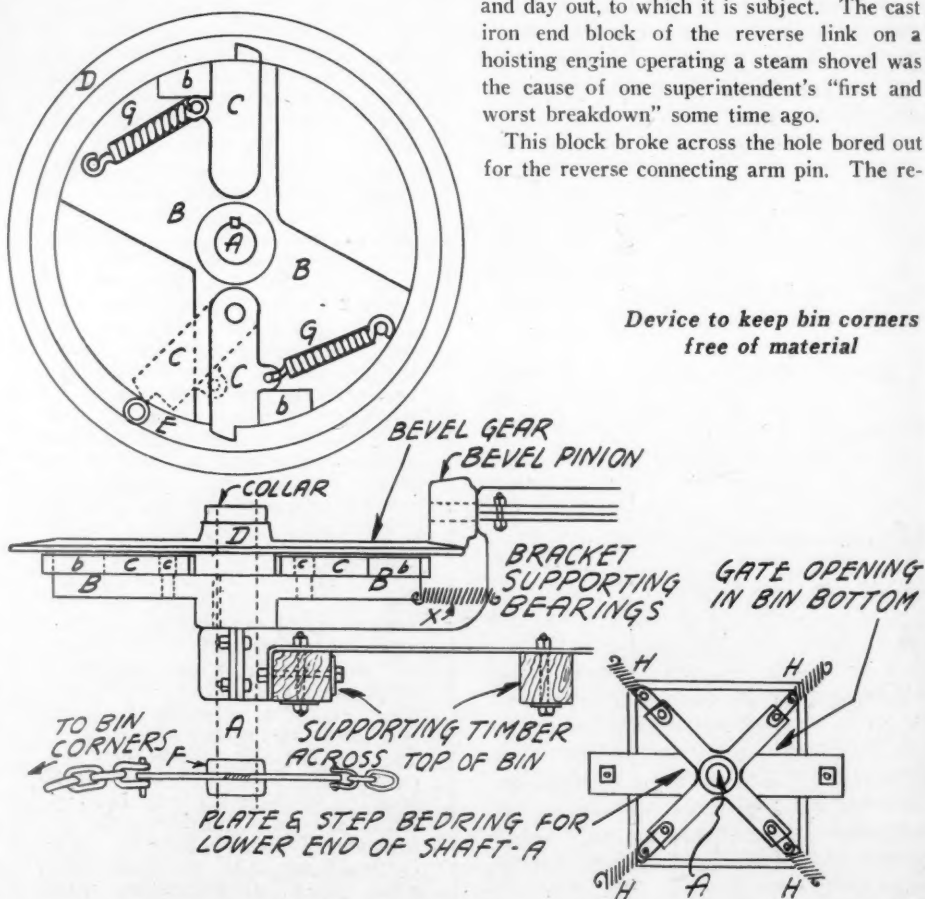
MANY operators are in need of some practical device, I believe, for jarring down materials that bridge. The accompanying illustration shows one possible device for meeting this problem. If it were set up in a bin with its lower end at the bin gate, it should start bridged material and keep it moving.

My idea is that it would operate about as follows. On opening the bin gate, the operator at the same time would throw in the switch of a motor which, through suitable transmission, would revolve gear D continuously until motor was stopped. The roller trip pin E on gear D would engage hammers C-C, give tension to the springs G-G, which when hammers were tripped would

rebound, causing them to strike the anvils b-b.

Take sand, for instance, packed tight around shaft A and spider F. The first blows of the hammers should transmit sufficient jar to start the material moving down along the shaft. As soon as the shaft and spiders begin to be jarred free they will revolve slightly in direction of gear travel until stopped by the take-up of slack on the spider chain.

This action also will tension springs H. The hammers tripping and striking the anvils, adding impetus and jar to the pull of the springs, should then revolve shaft, spiders and jar head assembly in the reverse direction. A considerable whipping effect would be developed by the spider chain, I believe, and result in the jarring down of considerable material out of bin corners that ordinarily would not move unless shoveled.



Device to keep bin corners free of material

A—Vertical shaft with bottom end stepped in bearing over or near bin gate and extending up to top of bin; B—jar head with anvils b-b, keyed to shaft; C—hammers pivoted on pins c-c; D—bevel gear revolving free on shaft; E—roller trip pin attached to and revolving with gear D and engaging hammers c-c; G—springs to rebound hammers; F—one of series of spiders with slightly slack chains attached to spider ends in bin corners; H—tension springs; X—alternate tension springs to rebound assembly to position in event springs H are not used

Shaft A might best be made of good sized pipe. A solid shaft would probably result in a less pronounced jarring action due to the greater inertia to be overcome.

Possibly a spring, as at X, in place of springs as marked by H, to return the assembly to position, and chains on bottom spider with a slight slack, would work out better. Again, a quicker and more positive tension and rebound on the H springs might result if, instead of being fastened to chain, the end opposite spider arms were attached to rigid pins or posts. It might also be that a quivering action might be developed if another set of springs and tension chains were put in position part way up the shaft.

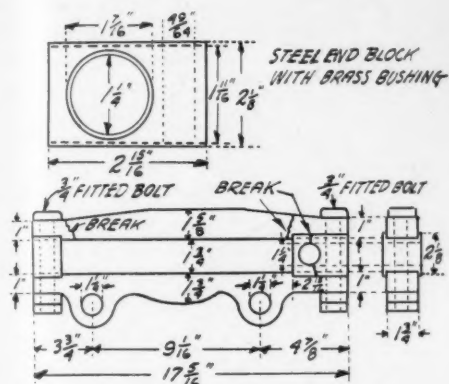
Link Block Renewal

A LINK BLOCK is often far from efficient when made out of cast iron because of the unusually heavy strain, day in and day out, to which it is subject. The cast iron end block of the reverse link on a hoisting engine operating a steam shovel was the cause of one superintendent's "first and worst breakdown" some time ago.

This block broke across the hole bored out for the reverse connecting arm pin. The re-

sult was that it would cause the link to break (as marked in the diagram). After being repaired it would sometimes break again, and would also break the eccentric strap—bending the strap connecting the link to the strap. All this meant loss in production, amounting in one case to 200 tons of material, before adequate repairs could be made.

"At my first opportunity," said the superintendent, "I made this block out of steel with a brass bushing for the reverse connecting strap to work in. I took a piece of



Insertion of brass bushing (above) and defective end block (below)

soft steel $2\frac{1}{4}$ by $2\frac{1}{4}$ by $2\frac{1}{16}$ -in., machined it to exactly the same measurement as the cast iron one with the exception of the $1\frac{1}{4}$ -in. hole. In the steel block I bored out this hole to $1\frac{1}{16}$ -in. and bushed it with a brass bushing bored to fit a $1\frac{1}{4}$ -in. pin.

"On our operation now we have five such links fitted with steel end blocks, four always in use and one for spare. In three weeks' time, at the time of the breakdown mentioned, I saw three of these links broken but in the past eight years there has been no trouble with links except for the normal routine of fitting in new brass bushings as they wear out."

Powder Box Protectors for Well Drill Holes

AT THE CLINTON POINT plant of the New York Trap Rock Corp., certain parts of the quarry are so stratified as to require casings in the churn-drill hole. The casings are allowed to stick up above the surface of the ground, and to facilitate the loading of free running dynamites in these holes old powder boxes are arranged around the collar of the hole in such fashion as to support a third box, as shown in the illustration. The third box is filled with screenings which are slightly tamped so as to make a funnel-like approach to the drill hole. This expedites the loading operation and prevents excess spillage of dynamite particles.

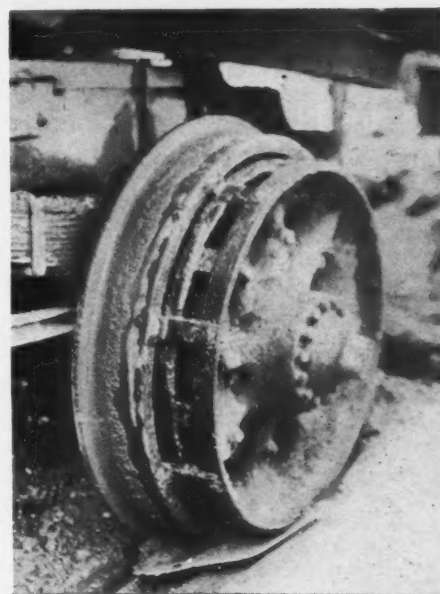


Street and railroad car wheel units on sand and gravel truck

Using a Truck on the Railroad Track in a Sand Pit

TO AVOID the necessity of keeping a smooth roadway across the floor of the pit, the East Peoria Sand and Gravel Co., of East Peoria, Ill., uses truck transportation by putting a track on car wheels and running it on the pit track. The front wheels used are old street car wheels, while the back wheels were made up of a tire from a railroad car wheel welded to the rim of the auto wheel, as shown in the accompanying illustration.

A second transmission, reversed from the first, was installed by a local auto repair shop for a few dollars. This installation permits the truck to move backwards with just as much speed as it moves forward, thus increasing the efficiency of the oper-



Rebuilt wheel for pit truck

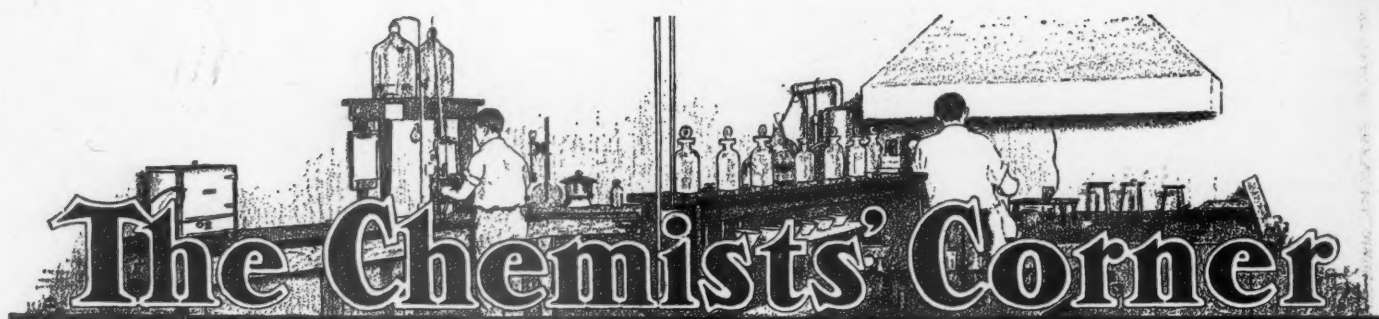
ation. The changed truck operates well on the track and gives quick and economical transportation from pit to plant.



Utilizing old powder boxes

Using an Old Dredge

WHEN the Lincoln Sand and Gravel Co., Lincoln, Ill., wanted to continue stripping operations in a pit that was being opened up, it was found that the water level was well above the bottom of the required stripping causing considerable inconvenience in getting out the material. To get around this difficulty an old dredge was set at work in the pond and pumped the water into another pond a few feet away where the company was also operating. The short distance between the ponds was securely dammed up and soon the level of the pond was considerably lower and permitted easy stripping with a dragline. It was necessary to keep the dredge pump in constant operation.



An Improved Method of Analysis for Determining Water Soluble Content

By A. E. Ford,

Chief Chemist, Green Bag Cement Co., Kenova, W. Va.

(1) To 150 grams of sample in 600 c.c. beaker, add 250 c.c. cool distilled water. Stir thoroughly, let stand 30 minutes at room temperature and stir again. Filter by aid of suction, transfer the insoluble matter to the funnel and suck dry. Return the insoluble matter to the beaker by means of the stream from cool distilled water bottle. The washing should amount to, at least, 150 c.c., but will usually exceed this amount before material is all transferred. Stir thoroughly, let stand 30 minutes and stir again. Filter, and again return the insoluble matter to the beaker as before. Stir thoroughly, let stand 30 minutes at room temperature and stir again. Filter as above.

(2) The large filtrate is acidified with HCL, but not in great excess and evaporated to workable proportions, about 300 c.c. or crudely 1 in. to 1½ in. in a 1500-c.c. beaker. The solution is made just ammoniacal and 15 c.c. of the boiling ammonium carbonate solution is added, and boiling continued for a few minutes. The solution is allowed to settle from 1 to 4 hours; filtered; washed with hot 1% ammonia solution and filtrate tested when boiling with a few drops of boiling ammonium carbonate. If clear, acidified with slight excess of HCL. If cloudy, the lime was not all thrown out previously. This solution may be transferred to large beaker from whence the filtration was made, as the heavy lime precipitate is dissolved in small excess of HCL anyhow, preliminary to a second precipitation of lime, the procedure of which is identical with the first. This filtrate from second precipitation is likewise tested for freedom from lime with ammonium carbonate. If clear, it is acidified and evaporated, either separately or combined with solution from first filtration. It is unwise, however, to use beaker containing first filtrate for the second filtration, for in case the last filtration is not clear, the entire filtrate must be settled and refiltered and the bulk attains proportions which lose time and are hard to handle.

(3) The following procedure for lime is non-essential in the basic scheme of analysis.

IT IS NOT CLAIMED that the procedure described is original in essence. It is, fundamentally, the generally accepted J. Lawrence Smith method structure, with some original additions and a general reconstruction, taking advantage of beneficial directions and suggestions by the foremost authorities. It includes the elimination of sulphur and magnesia. The notes are, for the most part, based on observations made in this laboratory.

The method is detailed somewhat with corresponding notes purposely, that it may be of service to some analyst who is not especially familiar with the delicate and hazardous steps encountered in the analysis of alkalies. If it partially eliminates the customary rechecking due to unfamiliarity with a new procedure, if it aids in getting over the more delicate stages successfully, or if it offers some enlightenment through the explanatory notes, it should be worth while.

—THE AUTHOR.

It is used only to arrive at estimation of magnesia dissolved in corresponding weight of agent necessary to eliminate it without adding in unknown excess.

The precipitate is washed with cold water to eliminate ammonium carbonate. About eight separate washings of beaker and ten more are necessary. The precipitate is dissolved in the least amount of HCL, ammonia added in slight excess and boiling ammonium oxalate is added to boiling solution. Allow to settle about four hours; filter; titrate lime content.

* * *

(4) Filtrates from $(\text{NH}_4)_2\text{CO}_3$ precipitations are evaporated in acid solution.

As soon as evaporation has proceeded to

¹J. Lawrence Smith, W. F. Hillebrand, Zimmerman, Berzelius, Treadwell, Arthur D. Little Laboratories, Purdue University Engineering Experiment Station, and the Trans-lator.

small volume, transfer to casserole, evaporate to dryness on water bath and dry in drying oven, preferably all night. The casserole is then placed on gauze over burner and heated until ammonia fumes cease to come off.

(5) When reasonably cool, the sides are washed with water, a few drops of HCL added and solution heated. Boiling BaCl_2 is added from pipette; 2 or 3 drops will usually suffice. Then without stopping to filter off, the practically insoluble barium sulphate, ammonia is added till slightly alkaline, a few drops of boiling ammonium carbonate and a couple of drops of ammonium oxalate. Allow to settle at least one hour. Filter. Discard. Precipitate.

(6) Evaporate filtrate to dryness on water bath; dry in oven; drive ammonium salts with heat. Cool, add water, a few drops of HCL and sufficient HgO to convert magnesia to hydroxide.

(7) Evaporate to dryness. Apply heat to casserole over moving flame in such a manner that dull red glow is barely visible through the porcelain. Allow to cool and filter off magnesia, washing with cold water and catching the filtrate in clean casserole.

(8) Make filtrate ammoniacal in hot solution. Add a few drops of hot ammonium carbonate and a couple of drops of hot ammonium oxalate. Allow to digest for one hour or more. Filter into weighted platinum dish, washing with 1% ammonia solution.

(9) Evaporate to dryness. Heat just to incipient redness to expel ammonia salts. Cool. Moisten residue with HCL. Evaporate to dryness. Heat just to dull redness. Cool and weigh. Repeat procedure until constant weight is obtained.

(10) Dissolve alkalies in water. Filter; wash thoroughly. Burn off filter paper and contents in the same platinum dish. Heat strongly, cool and weigh. Deduct this residue weight from weight before last filtration. This represents alkalies alone when initial weight of dish is deducted.

(11)
$$\frac{\text{Final weight obtained} \times 0.5303}{\text{Initial weight of material}} =$$

Percentage of water soluble alkali.

Notes

Numbers at left refer to corresponding numbered steps in the procedure.

(1) This is the latest method issued by Engineering Experiment Station at Purdue University, and is accepted as standard.

Cold water is used to trap any water-proofing compound, so that it will not be carried into the filtrate, as well as to approach the temperature of water used in commercial practice.

(2) A large excess of HCL requires corresponding quantity of ammonia for neutralization, during which time considerable ammonium chloride is formed. Calcium carbonate is not entirely precipitated in concentrated ammonium chloride solution.

Fifteen c.c. ammonium carbonate is usually sufficient. A few drops additional should be used to test the filtrate, however.

The hot solution effects more complete precipitation with a larger grained precipitate, which settles more rapidly than when precipitated with the lump form.

Settling for a period of less than one hour usually results in some lime being carried through the filter.

A small amount of alkali is carried in the lime. Thus a second precipitation to insure complete removal.

(3) Calcium carbonate is less soluble in cold water than when hot.

Lime value is obtained in terms of CaO. It is then converted by molecular proportion to the most soluble form of lime in the material. If known to contain calcium hydrate, that is used. If a sintered silicate, that is used. If unknown, a chemical analysis of ignition loss and CO₂ will supply information as to the ingredients. Using calcium hydrate as an example, the CaO converted to calcium hydrate divided by calcium hydrate found by chemical analysis of the sample, gives weight in grams dissolved. Now the MgO determined is converted to the most soluble form and multiplied by the weight in grams. The magnesium compound solubility divided by the calcium compound solubility gives factor which, when multiplied by the percentage of magnesium compound gives weight of magnesium compound in the most soluble form of this particular material. That weight converted to magnesium hydroxide by molecular proportions gives the weight of magnesium hydroxide. The weight of magnesium hydroxide is in turn converted to magnesium chloride. The weight of HgO necessary to complete the reaction with magnesium chloride is ascertained likewise.

(4) Evaporation on hot plate usually results in material climbing over the sides of casserole.

Decrepitation is bound to occur if casserole is heated after being taken to dryness on water bath unless material is first dried in oven.

Watch glass and glass clips are left over casserole at first part of heating operation.

As soon as it is assured that no decrepitation will occur, they are removed.

(5) Ammonium carbonate is used to eliminate excess barium, and ammonium oxalate because it precipitates lime more efficiently.

(6) Filtrate is taken to dryness and NH₃ salts driven off before addition of HgO, magnesia is soluble in the presence of ammonium salts.

HgO is used to eliminate magnesia, as it is more rapid and, as found in this laboratory, more efficient. The barium hydroxide method is very slow and cumbersome, as the barium is not completely removed after four dehydrations and re-precipitations. The ammonium carbonate method also has its disadvantages in magnesia removal.

The small excess of mercuric chloride and mercuric oxide is, of course, removed by the heat.

(7) Magnesia is filtered with cold water as an extra precaution to trap any water-proofing compound that may have survived to this stage, and to better retain the finely divided flocculent ash from the pyridine bases. The cold water readily dissolves the alkalies, even though the solubility values are not quite as high as with hot water.

(8) This extra step of the ammonium carbonate and oxalate precipitation serves several purposes. It assures further elimination of barium and lime and puts the filtrate in an ammoniacal state which, at the last dry-

ing stage, is much more easily kept from spattering than the filtrate from the magnesia.

(9) Full heat of a Meker burner will undoubtedly volatilize some of the alkalies. For this reason, a dull red heat on platinum is used.

Material should be watched very closely at the end of the evaporating period, as it will spatter some if allowed the hot plate's heat at this stage.

(10) Invariably, a milligram or so of insoluble material is found at this stage, and should be taken into account, to arrive at the true weight of the alkalies.

(11) Using factor 0.5303 assumes alkalies to be entirely sodium, which is seldom, if ever, true. It is used here because specifications are based on maximum limit as Na₂O.

General

It is true that alkali sulphates are not quite as volatile as are the chloride, but the chlorides evaporate faster, are less liable to loss from spattering and can be heated without volatilization, provided a reasonable amount of care is exercised.

The dense variety of filter paper provides more thorough elimination.

Ammonium carbonate solution is made up as follows:

100 gms. ammonium carbonate.
40 gms. ammonia.
400 gms. distilled water.

New Specifications for Boulder Dam Cement

More Work, More Apparatus, More Mathematics, for Cement Chemists

THE Bureau of Reclamation, U. S. Department of the Interior, received bids on 1,500,000 bbl. of portland cement at Denver, Colo., March 26. A copy of the specifications was received by Rock Products from Elwood Mead, commissioner of the Bureau of Reclamation, together with a letter which states: "Inasmuch as these specifications constitute an important step in advancing the art of concrete manufacture, which will exert a marked influence on concrete specifications in the future, I thought you might wish to give this matter some publicity and perhaps editorial comment."

The book of specifications is a veritable up-to-date textbook on cement analysis and testing and it is to be hoped that the supply is sufficient to place it in the hands of all cement company chemists and others interested.

Detail Requirements

The specification requirements cover: (1) chemical composition; (2) compound composition; (3) fineness; (4) soundness; (5)

time of setting; (6) compressive strength; (7) heat of hydration.

The chemical composition is fixed by the following limits:

Loss on ignition (not to exceed) 3.00%.

Insoluble residue (not to exceed) 0.85%.

Sulphuric anhydride (SO₃) (not to exceed) 2.00%.

Magnesia (MgO) (not to exceed) 5.00%.

The ratio of the percentage of iron oxide to percentage of aluminum oxide shall not exceed 1.5.

The compound composition (method of determination described in detail) shall be within the following limits:

Tricalcium silicate (3 CaO.SiO₂) not more than 40%.

Dicalcium silicate (2 CaO.SiO₂) not more than 65%.

Tricalcium aluminate (3 CaO.Al₂O₃) not more than 7%.

Tetracalcium aluminoferrite (4 CaO.Al₂O₃.Fe₂O₃) not more than 20%.

The specific surface, measured by the turbidimeter (described and illustrated), shall

not be less than 1700 nor more than 2300 sq. cm. per gram.

The time of initial set shall be in less than 60 min., and the final set within 10 hr.

The compressive strength of 2 x 4-in. cylinders (1:3) shall be not less than 1000 lb. per sq. in., 7 days, and 2000 lb. 28 days. The 28-day strength must be at least 35% higher than the 7-day.

The cumulative heat of hydration shall not exceed 65 cal. per gram at 7 days and 75 cal. at 28 days. The method of testing is described in detail.

Testing Methods

The method of chemical analysis is described and includes determination of (A) loss on ignition (two methods described) (B) insoluble residue; (C) sulphuric anhydride; (D) silica; (E) ferric oxide and alumina; (F) ferric oxide; (G) calcium oxide; (H) magnesia.

The method of analyzing for compound composition is that of Dr. Pogue in Paper No. 21, Portland Cement Association Fellowship, "Calculation of the Compounds in Portland Cement." An abstract is given in this specification, which includes graphs to facilitate the work.

For determining fineness, or surface area, the use of the Wagner turbidimeter is described and illustrated.

The heat of hydration is determined by the method described in detail in the specification, "or by the use of modified equipment and methods of procedure of equivalent accuracy." The method described includes the application of differential calculus, so if the test is generally adopted cement chemists will have to get out some of their school books, if they are to understand what they are about.

Details of the calorimeter are given in an accompanying plate. The determination of the heat capacity is by electrical methods using a precision potentiometer, galvanometer, and a calibrated precision 1/10 sec. stop watch. The apparatus for measuring the temperature within the calorimeter consists of a platinum resistance thermometer, Mueller temperature bridge, high sensitivity galvanometer and mercury commutator. The accompanying samples of a work sheet give an idea of the data and mathematics involved.

Publications Received

A Sedimentation Method for Determination of the Particle Size of Finely Divided Materials (such as Hydrated Lime), by Dana L. Bishop; U. S. Department of Commerce, Bureau of Standards, Research Paper RP642, 12 pp. Gives

theory of sedimentation method, description of method, etc., using butyl alcohol, comparison with microscopic method. Important to research workers on lime because of relation of particle size and size distribution to physical properties of lime.

"Here's How It's Built with Concrete"; Portland Cement Association booklet (20 pp.); handsomely printed and illustrated to emphasize the outstanding qualities of honestly built fireproof homes.

Quarry Accidents, 1932; Bulletin 376, 60 pp.; U. S. Department of Commerce, Bureau of Mines: Summary of statistics, showing causes of accidents. As usual, the principal cause of quarry accidents in 1932 was falling rock or overburden. Explosives came second.

The Flotation of Alabama Graphite Ores; by B. W. Gandrud, G. D. Coe, C. S. Benefield, and I. N. Skelton: United States Bureau of Mines Report of Investigations 3225; 20 pp.: Conclusions are that enough sulphuric acid should be added to oxidized flotation pulp to make pH values 3.0 to 5.0, which will simplify flow sheets. Unoxidized pulps gave acid reactions without treatment. Commercial concentrates with fairly satisfactory recoveries were obtained from all oxidized ores by grinding the primary flotation concentrates and retreating them in a second stage of flotation.

SAMPLE DATA SHEET

Time (t) min.	Calorimeter Temperature (T) eq. Ohms	T eq. ohms	Results	Date: 2-15-34
0	2.8258		β_s .1388	Cement: No. 1169
1	66	8		Age: 7 Days
2	75	9		Test: No. 1
3	85	10	V_s .00082	
4	93	8		
5	302	9		
6	10	8	β_K .1232	Wt. Calorimeter Sample: 4.2015g
7	2.8319	9		
8	27	8	V_K .0004	Loss on ign. 27.47%
9	35	8		
10	44	9		
11	52	8		
12	2.8360	8	Δt_x 9.	
13	3.07			
14	977			
15	990	K	.00466	
16	87			
17	84			
18	81	w	.000175	
19	77			
20	72			
21	3.0969	3	ΔT Uncorr. .2809	
22	65	4		
23	61	4	$K\beta_x \Delta t_x$ +.0045	
24	57	4		
25	53	4	$w \Delta t_x$ -.0016	
26	3.0949	4		
27	45	4	ΔT corr. .2638 = 2.630°C.	
28	41			
29				
30				

$$\frac{630.9 \times 2.630}{4.2015 \times .7255} = 544.5 \text{ cal./gram}$$

SUPPLEMENTARY COMPUTATION SHEET

$\beta_s = \frac{2.8319 + 2.8360}{2} - 2.9727 = -.1388$	Date: 2-15-34
$V_s = \frac{2.8360 - 2.8319}{5} = .00082$	Cement: No. 1169
$\beta_K = \frac{3.0959 + 3.0949}{2} - 2.9727 = .1232$	Age: 7 Days
$V_K = \frac{3.0949 - 3.0969}{5} = -.00040$	Test: No. 1
$V_s = \beta_s K + w$.00082 = -.1388 K + w	
$V_K = \beta_K K + w$ (Subtracting) -.00040 = .1232 K + w	
$K = -.00466$	
$w = .00082 - (-.1388 \times -.00466) = .000175$	
Total correction $L = K\beta_x \Delta t_x + w \Delta t_x$	
$\beta_x \Delta t_x$ (by trapezoidal rule): 1/2 first ordinate = 1.4180	
1/2 last ordinate = 1.5485	
Sum intermediate ordinates = 24.7568	
Sum = 27.7233	
Subt. Bath $\times \Delta t_x$ = 26.7545	
$\beta_x \Delta t_x = .9690$	
$K\beta_x \Delta t_x = -.00466 \times .9690 = -.00451$	
$w \Delta t_x = .000175 \times 9. = .00156$	
$L = -.00295$	
$\Delta T_x (\text{uncorr.}) = 3.0969 - 2.8360 = .2609$	
L (total corrections) = -.00295	
$\Delta T_x (\text{corr.}) = .2638$	
Heat capacity $\times \Delta T_x (\text{corr.})$	
Conversion factor (ohms to degrees C) \times Wt. sample \times (1 - loss on ign.)	
$\frac{630.9 \times .2638}{.1003 \times 4.2015 \times .7255} = 544.5 \text{ cal./gram}$	

CEMENT PLANTS FIGHT SILICOSIS RACKET

DOES EMPLOYMENT in or about a cement mill predispose workers to silicosis or tuberculosis?

That's the question that the cement industry answers in the negative, while certain plaintiffs, appearing more numerous of late, are proceeding to test the issue in the courts.

The first "silicosis" case against a portland cement manufacturer in Illinois came to trial recently in the Circuit Court at Chicago. After a solid week of legal combat the case was terminated on March 3, on completion of the plaintiff's evidence, by the Court granting the defendant's motion for an instructed verdict.

The court held that the plaintiff had failed to make a prima facie case. In plain language, the plaintiff's case collapsed in utter defeat before presentation of any evidence whatsoever by the defendant.

Almost simultaneously, the first two "silicosis" cases against a Missouri cement manufacturing company came to trial in the Circuit Court at St. Louis, and after hard fought legal contests, resulted in victory for the two plaintiffs, in one case carrying a judgment of \$25,000 and in the other, \$15,000. These suits are sure to be appealed.

The winning of these cases by plaintiffs led to the immediate filing of a number of further suits against the defendant. Concerns in the vicinity other than cement manufacturers face an aggregate of some 300 suits of the same general character. Distinction may be made in the case of the cement manufacturers because of the fact that their dust is known to contain only about 1% of free silica, and that dust concentrations are far below the determined "danger" point. Consequently in the minds of most of the cement fraternity these suits are purely rackets and must be dealt with as such.

Industry Felt Safe from Attack

Since the report of the United States Public Health Service upon the results of a three-year study of the dust problem of the manufacturer of portland cement (Public Health Bulletin 176, April, 1928), until a recent time, it has been conceded by all of the leading authorities that dust incident to that industry did not predispose the workers to silicosis or tuberculosis—nor in fact to any disease of the respiratory organs, which tended to become chronic in nature and to result in any permanent disability. The calcium dust of the cement was apparently beneficial to active pulmonary tuberculosis because of an apparent tendency to accelerate calcification resulting in closing off the tubercles.

The industrial disease racket, though it

sprang up like a mushroom, has developed with the strength of a mighty tree to the point where it bids fair to make the liquor, kidnapping, and even the labor rackets look insignificant by comparison of the amounts involved, the losses caused to the public, and the enormous profits received and the small risks incurred by the racketeer.

The state of Missouri may be said to be a paradise for this type of racketeering. Under its laws nine jurors out of twelve may decide a case. While the laws against barratry and champerty are still in existence, they have apparently been forgotten. Plaintiffs' attorneys have employed runners or solicitors who have combed the state, paying particular attention, of course, to the unemployed. At first they confined themselves to cases where there was some disability, but more lately incidents have been reported where solicitation has been carried on amongst workers still engaged in active work and who have no apparent symptoms of disability other than dust on their clothing as they come from work and some outward appearance of age. It is reported that as much as \$25 a case is paid to the solicitors for every signed contract brought in. The cases are taken on a 50% contingent basis and notices under the attorney's lien law are promptly served upon the employers.

The intended plaintiff is given a more or less thorough examination. As every doctor knows, an X-ray picture taken of the chest of any adult in any walk of life will almost invariably show some fibrosis or scar tissue and in a large majority of cases some so-called calcification indicating a closed tuberculosis condition. Furthermore, every human being from the cradle to the grave is subjected to inhaling dust, which may or may not have a high silica content, but which over a period of time will certainly cause a change in the lung picture. This, of course, is particularly true in environments where dust is likely to be prevalent, such as great cities or dusty and dry localities.

So many of the cases have been brought and so little has been known about the true nature of the disease of silicosis or silico-tuberculosis that few of the cases have been tried in a thorough and scientific manner. The results have been what are often referred to in the legal profession as "sloppy" decisions. Unjust criticisms have been made of the courts on account of these decisions. Of course, neither the trial nor reviewing courts can be expected or required to go beyond the confines of the records presented to them, and if the cases are not presented in a thorough and scientific manner the judges cannot be presumed to have or to apply the technical knowledge necessary to a fair decision.

With any sort of ingenuity and co-operation from the medical and engineering profession it is simple for the plaintiff to make a prima facie case or to make a case that will stand up on appeal, unless the defense is prepared carefully, methodically and thoroughly with able medical and scientific assistance. Such assistance was had in the recent Chicago case and as a result of it, the so-called experts testifying for the plaintiff were confounded. In passing, it would be interesting to note that one of these so-called medical experts testified in substance that he had examined and diagnosed between three and four hundred cases of pneumoconiosis, but he admitted under cross-examination that only one of all these cases had come to him independently of plaintiff's lawyers.

While the instructed verdict in this first case tried against the cement industry in Chicago is very encouraging and it is believed will do much to discourage the solicitation and prosecution of similar cases, yet the problem should be attacked by the organization of information clearing houses to list and analyze every case filed. Co-operation must be secured from the defendant industries to finance the investigation of solicitation and framing of these cases and the prosecution of persons that may be found to have been engaged in conspiracies to obtain money under false pretenses or to induce or suborn perjury or those indulging in other unlawful and corrupt practices in connection with such cases. Co-operation of the American Medical Association, the American, state and local bar associations should be obtained so as to discipline or cancel the license to practice of lawyers and doctors who have indulged in dishonest practices in such cases. Pressure must be brought to bear upon liability and industrial insurance companies to aid.

Often the settlement of these cases with attorneys amounts to something little short of blackmail. Every such settlement only encourages and stimulates the racket which today has developed to the point of serious interference with the national industrial recovery.

Lime

Diamond Springs Lime Co., near Placerville, Calif., recently made a shipment of 45 tons of lime to Mej Chontales, San Juan del Sur, a town in southwest Nicaragua. The lime was packed in 900 steel drums which were "packed" in from the coast on the backs of burros.

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Louisiana Products Corp., Shreveport, La., W. G. Gray, president, plans a chemical plant near Winnfield, La., to produce lime, calcium chloride, sodium sulphate and kindred products, to cost between \$500,000 and \$1,000,000. The limestone will come from the quarry formerly operated by the Southern Minerals Co.

From Rock Products' Readers

San Francisco Bay Bridge Aggregates—A Correction

THE EDITOR: The March issue of *ROCK PRODUCTS* contains an interesting article on the concrete for the San Francisco Bay Bridge.

In the interest of accuracy we would like to draw your attention to certain errors in this article which concern ourselves. It sets forth that wet mix concrete is being used exclusively in this work and is being supplied by the Henry J. Kaiser Co. in mixer barges. The third paragraph of the article states that the aggregates come from a group of producers, including among others the California Rock & Gravel Co.

Wet mix concrete is not being used exclusively on the job and the California Rock & Gravel Co. did not participate in supplying aggregates for the wet mix, as your article states.

The Healy Tibbitts Construction Co. has the contract for the anchorage and Pier 1 on the San Francisco end of the bridge, which is generally conceded to be one of the most important units of the work, running considerably in excess of \$1,000,000. This company is mixing its own concrete on the job; and the sand and gravel, approximating about 200,000 tons, is being supplied exclusively by the California Rock & Gravel Co.

The anchorage is a block of concrete 108 ft. x 184 ft., which rests on and is keyed into rock at El. minus 30, and will extend to El. plus 160. The top of the anchorage incorporates the double deck roadway within its limits. Steel anchorage girders and eye-

bars to which the cables are to be attached are imbedded in the concrete.

The viaduct is a double-decked, reinforced-concrete structure 325 ft. long and 70 ft. wide, extending from the west face of the anchorage to a point on Rincon Hill where the ground surface rises to meet the lower deck elevation. The topography is quite rugged under this structure as the lower deck upon leaving the anchorage is 100 ft. above the ground.

Piers A and B are spread footings each 27 ft. x 104 ft. excavated to 35 ft. below street level. These piers support 377 ft. steel spans not carried by cables.

Pier No. 1 is being built in a steel sheet pile cofferdam 56 ft. x 112 ft. and rock bottom is at El. — 60, which is 72 ft. below street level. From El. — 60 this pier will rise to El. + 188, in solid concrete pylons. This pier supports a steel rocker truss over which the cable moves in its expansion and contraction.

There are 105,000 cu. yd. of concrete in Contract No. 3, distributed as follows: Anchorage, 68,000 cu. yd.; viaduct, 10,000 cu. yd.; Piers A and B, 7,000 cu. yd.; and Pier No. 1, 20,000 cu. yd.

To mix the concrete in these various units the contractor has built a most modern plant. Railroad track storage has been provided for about 50 cars of aggregate. Bottom dump cars spill into hoppers that feed a belt conveyor which in turn loads a bucket elevator, carrying the material to gravity storage.

Four sizes of aggregate are being furnished, two sands and two rocks up to 2½-in. size. Toledo Scale equipment for measur-

ing aggregates and cement is being used. Water is measured by volume. Bulk cement is handled by the Fuller-Kinyon system from cars to a silo and then to the mixer by means of a screw conveyor.

The mix is under the constant control and supervision of the resident engineer for the State of California, N. W. Reese.

An excellent grading of aggregate is furnished. Extremely workable and satisfactory mixes without the use of admixtures result from the careful and cooperative supervision of the State's representatives, the excellent grading and quality of aggregate and the first class batching and mixing equipment. A 2-cu. yd. mixer with a capacity of 50 cu. yd. per hour is being used.

The concrete in the anchorage is being placed by means of a guy derrick and a 4-cu. yd. bottom-dump bucket.

F. W. ERLIN,

Vice-President, California Rock & Gravel Co., San Francisco, Calif.
March 12, 1934.

* * *

A Bouquet or Two!

THE EDITOR: I have just read your editorial on the front page of *ROCK PRODUCTS* for March and I want you to know that your expression of the idea that the best way to loosen credits is to improve earning capacity of business is certainly well expressed. In all the articles I have read during this period of depression it crystallizes probably the most important factor.

If the administration and code administrators can be made to constantly feel this necessity through just such articles I believe a great deal of the pressure which is now being applied to break down prices through preventing price publication, etc., would be relieved.

PHILIP L. CORSON.

Plymouth Meeting, Penn.,
March 13, 1934.

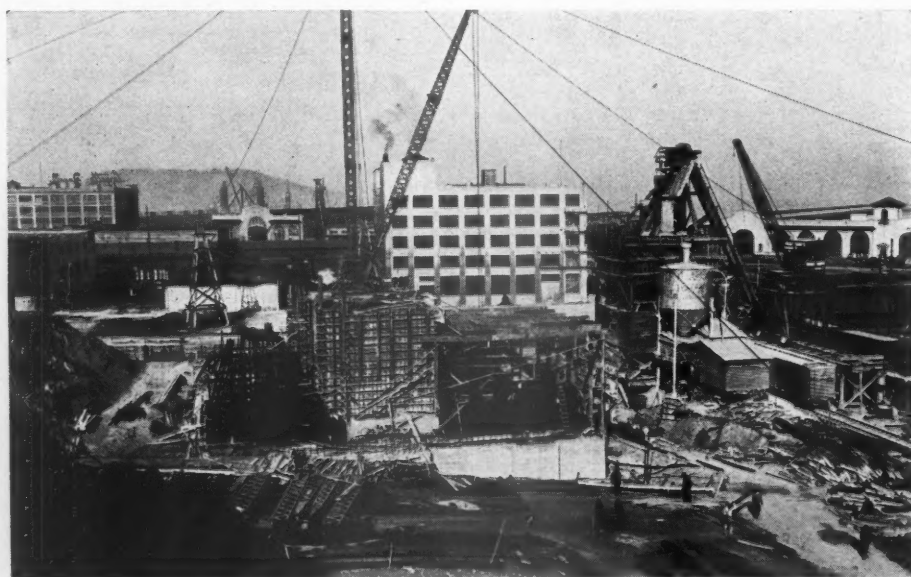
* * *

"Hearty Accord"

THE EDITOR: I am taking the first opportunity to express my appreciation of the editorials appearing in the March issue of *ROCK PRODUCTS*: Whether I agreed with them or not, I would certainly admire the courage it took to express your convictions so forcibly on the Government's tactics in the business and industrial worlds, particularly as related to your field of endeavor. Since, however, I am in such hearty accord with your present thinking, it is very easy to wish on you an extra large bouquet.

HERBERT F. KRIEGE.

Toledo, Ohio,
March 6, 1934.



Concrete-mixing plant of the Healy Tibbitts Construction Co. on San Francisco anchorage of the Bay Bridge—Aggregates furnished by California Rock and Gravel Co.

Editorial Comments

All signs point to the development of residential building on a huge scale as a spur to recovery in the capital or durable goods industries. Large housing

Residential Market for Rock Products

programs have already been undertaken in European countries faced with the same problem of unemployment. In this country the spending of billions on housing is rapidly gaining new converts from week to week. Financially or economically sound or not, adequate and decent housing has a strong appeal to all socially-minded people. It is one way of sharing immediately the achievements of modern engineering and industry—modern wealth—one that will not much longer be ignored by a socialist-inclined government. The question naturally arises, are rock products producers and manufacturers prepared to get their share of this business that inevitably is approaching? We doubt if they are.

With the exception of lime and gypsum manufacturers, whose chief market for building products has always been residential and commercial construction, rock products producers have had their attention and talents always focused on markets which required large individual shipments—highways, dams, bridges, and public works generally. They have largely ignored, or left to the building supply dealer, the development of the small order market for residential building. The building supply dealer, naturally, is most interested in making the largest possible profit, and there is very little profit in retailing most rock products, compared to the profit in lumber and a host of other building products—particularly is this true of sand, gravel, crushed stone and slag.

Although the Portland Cement Association has done, and is now doing, some effective promotional work in the residential field, it has a long way to go to get the public as thoroughly conscious of the possibilities of cement as it is of lumber, or brick, or even of steel. Lumber and brick have been the traditional home-building materials for so many generations that their use is familiar enough to be in nursery rhymes, such as "The Three Little Pigs," while the use of steel has an element of novelty, which has appealed to the popular imagination, in spite of the short time its use has been actively promoted. There is no element of novelty in the use of concrete and it is too familiar to the average citizen as the material of construction of pavements, dams, bridges, and other drab and often unsightly structures, to have any appeal to the imagination.

Moreover, cement manufacturers alone should not be compelled to carry the entire burden of promoting concrete. The crushed stone, sand and gravel, and slag producers should share almost equally in the dollars and cents value of the concrete market, and in point of tonnage should get a much larger proportion than do cement manufacturers. While the average citizen probably has some conception of what portland cement is, and knows that it is a

manufactured product, he is seldom aware that the aggregates he must use with cement to make the best concrete also require careful preparation and are also articles of commerce. All sand, gravel or stone, from whatever source, are the same to him. If ever an educational—advertising and promotional—job was needed, it is for the purpose of selling the proper use of good clean, durable concrete aggregates to the average citizen home owner.

The state of Illinois has little or no lumber industry; it has a wealth of mineral industries whose prosperity depends largely on construction. It has a very live State Geological Survey and a very able, energetic, go-getting chief geologist—Dr. M. M. Leighton—who is constantly seeking to find and develop markets for these minerals, as well as to develop new mineral products. Recently, probably largely at his instigation, there was held a conference on home building, at which special emphasis was placed on the mineral resources of Illinois available for home building. An impressive list of national and state professional and industrial associations coöperated. No association of rock products producers or manufacturers was represented. The Illinois Clay Manufacturers' Association was, and a superintendent of the Illinois Brick Co. made good use of the opportunity to get in a paper on reinforced brick masonry.

All these speakers emphasized the need and desire for "efficient, attractive, safe, economical, quiet, fireproof homes." Certainly the men who attended are going to be important factors when the Federal home-building program in Illinois materializes. Producers of rock products could have gleaned many good sales arguments, from the very ones whom in all probability they will have to sell in the near future. For example the head of the department of architecture of the University of Illinois said:

All materials used in the low-cost house must be so selected and so used as to reduce obsolescence and depreciation to a minimum. The mineral resources of Illinois offer a great undeveloped field which, when used, will reduce these losses. . . . The tendency is to look for something unusual, something new, but the solution will come from some simple combination of common raw materials. The first cost of a house may be cheaper in one form of construction than in another, but will the total cost over a period of years be the less? A fire-resisting, well-insulated, well-built house will usually have a higher initial cost, but over a period of years this house may be the cheaper. . . . The people of this country will not become nomads, living in tin houses on wheels; they want real homes. These homes must be designed to suit the needs and tastes of each family, not built by the hundreds, all alike. Illinois has the raw materials, and it is up to human genius to so use from this great storehouse the right combinations of materials, so treated, so assembled, so arranged, that this moderate-priced house will become a reality within the next decade.

Is there any group of building material producers and manufacturers more capable of supplying the type of home described than those in the rock products industry? Not ten years hence, but right now.

Recent Quotations on Rock Products Securities

Stock	Date	Bid	Asked	Dividend	Stock	Date	Bid	Asked	Dividend
Allentown P. C., com. ⁴⁷	4-19-34	4½	5½		McCready-Rodgers, 7% pfd. ⁴⁷	4-19-34	40	45	
Allentown P. C., pfd. ⁴⁷	4-19-34	5	6½		Medusa P. C., com. ⁴⁷	4-19-34	9	11	
Alpha P. C., com. ⁴⁷	4-16-34	15½	15½		Medusa P. C., pfd. ⁴⁷	4-19-34	40	45	
Alpha P. C., pfd. ⁴⁷	4-19-34	80	85	\$1.75 qu. Mar. 15, '34	Michigan L. and O., com. ⁴⁷	4-19-34	65	70	
Amalgamated Phos. 6's, '36 ⁴⁷ ..	4-19-34	97	100		Missouri P. C., com. ⁴⁷	4-13-34	7½	actual sale	
American Aggregates, com. ⁴⁸ ..	4-10-34	1½	3½		Monarch Cement, com. ⁴⁷	4-19-34	75	85	2% Mar. 15, '34
American Aggregates, pfd. ⁴⁸ ..	4-10-34	10	20		Monolith P. C., com. ⁹	4-10-34	1¼	2¼	
American Aggregates, 6's, 1st	4-10-34				Monolith P. C., 8%, pfd. ⁹	4-10-34	4	5	25c Mar. 10, '34
mtg. 3/6's, 1943, new ⁴⁸	4-10-34	35	40		Monolith P. C. units ⁴⁷	4-19-34	10	12	
American Aggrs., 6's, '43, old ⁴⁸	4-10-34	33	37		Monolith P. C., 1st Mtg. 6's ⁹ ..	4-10-34	81	83	
American L. and S., 1st 7's ⁴⁸ ..	4-10-34	72	80		Monolith Portland, Midwest ⁹ ...	4-10-34	40c	65c	
Arundel Corp., com. ⁴⁸	4-10-34	10	20	25c qu. Apr. 2, '34					
Bessemer L. and C., Class A ⁴⁷ ..	4-19-34	3	5		National Cem. (Can.), 1st 7's ⁴²	4-9-34	95	...	
Bessemer L. and C., 1st 6½'s,	4-10-24	22	...		National Gypsum A., com. ⁴⁷	4-21-34	6½	7¼	
1947.....					National Gypsum, pfd. ⁴⁷	4-21-34	76	78	
Bessemer L. and C., cert. of	4-10-34	20	...		National Gypsum 6's ⁴⁷	4-19-34	85	90	
dep., 1947.....					National L. & S., 6½'s, 1941 ⁴⁷	4-19-34	70	75	
Bloomington Limestone 6's ⁴⁷ ..	4-19-34	8	10		Nazareth Cement, com. ⁴⁷	4-19-34	5	8	
Boston S. and G., new com. ⁴⁷ ..	4-10-34	1	3		Nazareth Cement, pfd. ⁴⁷	4-19-34	30	35	
Boston S. and G., new 7% pfd. ⁴⁷	4-10-34	4	10		Newaygo P. C., 1st 6½'s, 1938	4-10-34	42	46	
Boston S. and G., 7's, 1934 ⁴⁷ ..	4-10-34	45	...		New England Lime 6's, '35 ⁴⁴ ..	4-9-34	7	10	
California Art Tile, A ⁹	4-10-34	1	2½		N. Y. Trap Rock 1st 6's, 1946.	4-21-34	61½	actual sale	
California Art Tile, B ⁹	4-10-34	...	3½		N. Y. Trap Rock, 7% pfd. ⁴⁷	4-19-34	4	subject	
Calaveras Cement, com. ⁴⁷	4-12-34	1½	1½		North Amer. Cement 1st 6½'s ⁴⁷	4-19-34	20	25	
Calaveras Cement, 7% pfd. ⁴⁷ ..	4-12-34	47½	75	1.75 qu. Jan. 15, '34	North Amer. Cement, com. ⁴⁷	4-19-34	1	2	
Canada Cement, com. ⁴⁷	4-9-34	9	actual sale		North Amer. Cement, 7% pfd. ⁴⁷	4-19-34	3	5	
Canada Cement, pfd. ⁴⁷	4-9-34	43½	actual sale		North Shore Mat. 1st 6's ⁴⁷	4-19-34	45	50	
Canada Cement, 5½'s, 1947.....	4-10-34	89¾	91		Northwestern States P. C., com.	4-21-34	50	...	\$1.50 Jan. 2, '34
Canada Crushed Stone bonds ⁴²	4-9-34	75	...		Northwestern Port. Cem., units ⁹	4-10-34	37	40	
Canada Crushed Stone, com. ⁴² ..	4-9-34	5	...						
Certainite Products, com. ⁴⁷	4-16-34	6½	6%		Ohio River S. and G., com. ⁴⁷	4-18-34	...	5	
Certainite Products, pfd. ⁴⁷	4-16-34	30	34		Ohio River S. and G., 1st pfd. ⁴⁷	4-18-34	25½	...	
Certainite Products, 5½'s, '48.	4-16-34	71½	actual sale		Ohio River S. and G., 2d pfd. ⁴⁷	4-18-34	...	2½	
Cleveland Quarries.....	4-19-34	5	...		Ohio River S. and G., 6's.....	2-20-34	10	12	
Consol. Cement, 1st 6½'s, '41 ⁴⁷	4-19-34	20	22		Oregon P. C., com. ⁴⁷	4-19-34	5	10	
Consolidated Cement, pfd. ⁴⁷	4-19-34	1	2		Oregon P. C., pfd. ⁴⁷	4-19-34	40	50	
Consolidated Oka S. and G.	4-19-34	...	...				
(Canada) 6½'s ⁴²	4-19-34	25	...		Pacific Coast Aggr., com. ⁴⁰	4-9-34	5c	...	
Consol. Rock Prod., com. ⁴⁷	4-19-34	1½	1		Pacific Coast Aggr., pfd. ⁴⁰	4-9-34	15c	25c	
Consol. Rock Prod., pfd. ⁴⁷	4-19-34	1	2		Pac. Coast Aggr., 6½'s, '44 ⁴⁰	4-9-34	16½ F	18 F	
Consol. Rock Prod., units ⁴⁷	4-19-34	2	3		Pacific Coast Aggrs., 7's, '39 ⁴⁰	4-9-34	2	4	
Construction Mat., com. ⁴⁷	4-19-34	1	2		Pacific Coast Cement 6's, '37 ⁴⁰	4-9-34	97	...	
Construction Mat., pfd. ⁴⁷	4-19-34	2	4		Pacific P. C., com. ⁴⁰	4-9-34	4	5½	
Consumers Rock & Gravel, 1st	4-19-34	...	...		Pacific P. C., pfd. ⁴⁰	4-9-34	32	36	
Mtg. 6½'s, '48 ⁴⁷	4-19-34	30	35		Pacific P. C. 6's, '35 ⁴⁰	4-9-34	99½	...	
Coosa P. C., 1st 6's ⁴⁷	4-19-34	10	15		Pacific P. C. 6½'s, pfd. ⁴⁷	4-9-34	30	...	
Coplay Cement Mfg., pfd. ⁴⁷	4-19-34	6	8		Peerless Cement, com. ⁴⁷	4-19-34	¼	¾	
Coplay Cement Mfg., 6's, '41 ⁴⁷	4-19-34	45	50		Peerless Cement, pfd. ⁴⁷	4-19-34	1	2	
Dewey P. C., com. ⁴⁷	4-19-34	70	80		Penn.-Dixie Cement, com. ⁴⁷	4-21-34	6¼	6%	
Dolese and Shepard.....	4-21-34	10	13		Penn.-Dixie Cement, pfd. ⁴⁷	4-16-34	24	27½	
Dufferin Pav. & Cr. Stone, com.	4-9-34	3	actual sale		Penn.-Dixie Cement, 6's A, '41.	4-21-34	76	actual sale	
Dufferin Pav. & Cr. Stone, pfd.	4-9-34	35	actual sale		Penn. Glass Sand Corp., pfd. ⁴⁷	4-19-34	70	75	\$1.75 Apr. 1, '34
Edison P. C., com. ⁴⁷	4-19-34	1	2		Penn. Glass Sand Corp., 6's ⁴⁷ ..	4-19-34	97	100	
Edison P. C., pfd. ⁴⁷	4-19-34	2	4		Petoskey P. C., 6's, '41 ⁴⁸	4-10-34	40	45	
Federal P. C. 6½'s, 1941 ⁴⁷	4-19-34	30	33		Petoskey P. C., 6's, 1935-'38 ⁴⁸	4-10-34	43	46	
Florida Port. Cement 6½'s, '37	4-6-34	65	68		Petoskey P. C., units ⁴⁷	4-16-34	1¾	2	
Giant P. C., com. ⁴⁷	4-19-34	2	4		Port Stockton Cem., com. ⁴⁷	4-10-34	No market		
Giant P. C., pfd. ⁴⁷	4-19-34	14	17						
Gyp. Lime & Alabastine, Ltd.	4-9-34	6½	actual sale		Republic P. C., 6's, 1943 ⁴⁷	4-19-34	60	66	
Gyp. Lime & Alabastine 5½'s,	4-10-34	74	77		Riverside Cement, A ⁹	4-10-34	7½	8½	20c May 1, '34
1948.....					Riverside Cement, B ⁹	4-10-34	1	2	
Hermitage Cement, com. ⁴⁷	4-19-34	10	15		Riverside Cement, pfd. ⁹	4-10-34	77	80	1.50 qu. May 1, '34
Hermitage Cement, pfd. ⁴⁷	4-19-34	40	50		Rockland and Rockport Lime,	4-19-34	2	3	
Ideal Cement 5's, 1943 ⁴⁷	4-19-34	100	102		1st pfd. ⁴⁷				
Ideal Cement, com. ⁴⁷	4-21-34	30	34	25c qu. Apr. 2, '34	Sandusky Cement 6's ⁴⁷	4-19-34	40	45	
Indiana Limestone 6's ⁴⁷	4-19-34	13	16		Sandusky Cement 6½'s, 1932-	4-19-34	45	50	
International Cement bonds, 5's,	4-21-34	73¾	actual sale		1937 ⁴⁷	4-19-34	...	52	\$1.00 qu. Apr. 1, '34
International Cement, com. ⁴⁷	4-16-34	28½	29½		Santa Cruz P. C., com. ⁹	4-19-34	1	3	
Kelley Island L. and T.....	4-19-34	11½	12	15c qu. Apr. 1, '34	Schumacher Wallboard, com. ⁴⁷	4-19-34	1½	3½	
Ky. Cons. Stone, 6½'s, 1933....	4-18-34	5	6		Schumacher Wallboard, pfd. ⁴⁷	4-10-34	8	10	
Ky. Cons. Stone, com. ⁴⁷	4-19-34	1	2		Signal Mt. P. C., pfd. ⁹	4-10-34	75½	78¼	
Ky. Cons. Stone, pfd. ⁴⁷	4-19-34	3	5		Southwestern P. C., units ⁴⁰ ...	4-9-34	100	100½	
Ky. Cons. Stone, 7% pfd. ⁴⁷	4-19-34	3	5		Standard Paving & Mat. (Can-	4-9-34	4	actual sale	
Ky. Cons. Stone, 1st Mtg. 6½'s ⁴⁸	4-19-34	7	...		ada), com. ⁴⁷	4-9-34	21½	actual sale	
Ky. Cons. St. V. T. C. ⁴⁷	4-23-34	1	2		Standard Paving & Mat., pfd..	4-9-34	26	27	55c May 1, '34†
Ky. Rock Asphalt, com. ⁴⁸	4-19-34	10	subject		Superior P. C., A ⁴⁰	4-9-34	5½	7½	55c May 1, '34†
Ky. Rock Asphalt, pfd. ⁴⁷	4-18-34	6	8		Superior P. C., B ⁴⁰	4-9-34	...	...
Ky. Rock Asphalt 6½'s, '35 ⁴⁸	4-19-34	60	...						
Kentucky Stone, com. ⁴⁷	4-19-34	...	¾		Trinity P. C., units ⁴⁷	4-19-34	25	30	
Kentucky Stone, pfd. ⁴⁷	4-19-34	...	8		Trinity P. C., com. ⁴⁷	4-19-34	4	7	
Lawrence P. C.....	4-21-34	12½	15½		Trinity P. C., pfd. ⁴⁷	4-19-34	23	28	
Lawrence P. C., 5½'s, 1942 ⁴⁷	4-19-34	70	75						
Lehigh P. C., com. ⁴⁷	4-16-34	16	17		U. S. Gypsum, com. ⁴⁷	4-21-34	41¾	42	25c qu. Apr. 2, '34
Lehigh P. C., pfd. ⁴⁷	4-16-34	76	77½	87½ qu. Apr. 2, '34	U. S. Gypsum, pfd. ⁴⁷	4-21-34	127	128	1.75 qu. Apr. 2, '34
Louisville Cement ⁴⁷	4-19-34	70	75						
Lyman-Richey 1st 6's, 1935 ⁴⁷ ..	4-19-34	90	100		Wabash P. C. ⁴⁷	4-19-34	7½	9	
Marbelite Corp., com. (cement	4-9-34	1¼	...		Warner Co., ww., 1st 6's ⁴⁷	4-19-34	20	35	
products) ⁴⁹					Warner Co., ex.w., 1st 6's ⁴⁷ ...	4-19-34	20	35	
Marbelite Corp., pfd. ⁴⁹	4-9-34	55c	...		Warner Co., com. (sold at auc-	3-7-34	2½	actual sale	
Marquette Cement, com. ⁴⁷	4-19-34	50	55		tion Philadelphia).....				
Marquette Cement, pfd. ⁴⁷	4-19-34	50	55		Warner Co., pfd. (sold at auc-	3-7-34	7½	actual sale	
Marquette Cem. Mfg. 1st 5's,	4-10-34	75	85		tion, Philadelphia).....				
1936 ⁴⁷					Whitehall Cem. Mfg., com. ⁴⁷ ..	4-19-34	35	45	
Marquette Cem. Mfg. 1st 6's,	4-19-34	96	...		Whitehall Cem. Mfg., pfd. ⁴⁷ ...	4-19-34	50	55	
1935 ⁴⁸					Wisconsin L. & C., 1st 6's, '33 ⁴⁷	4-19-34	90	95	
Material Service Corp. ⁴⁷	4-19-34	4	6		Wisconsin L. & C. 6½'s ⁴⁷	4-19-34	90	95	
McCready-Rodgers, com. ⁴⁷	4-19-34	7	9		Wolverine P. C., com. ⁴⁷	4-19-34	2	3	
					Yosemite P. C., A, com. ⁴⁷	4-9-34	1½	2	

Quotations by: ^{9A}A. E. White Co., San Francisco, Calif. ¹²James Richardson & Sons, Ltd., Winnipeg, Man. ¹⁴First Wisconsin Co., Milwaukee, Wis. ²⁷Wine Hobbs & Arnold, Boston. ⁴⁰Martin Jodge, Jr., and Co., San Francisco, Calif. ⁴²Nesbitt, Thompson & Co., Toronto. ⁴⁶First National Bank of Chicago, Chicago, Ill. ⁴⁷Anderson Plotz and Co., Chicago, Ill. ⁴⁸Hewitt, Iadlin & Co., New York, N. Y.

F—Flat. †The payment is on arrears and leaves accumulated unpaid dividends of \$1.92½ a share.

Riverside Cement Co., Riverside, Calif., declared the regular quarterly dividend of \$1.50 on the \$6 cumulative first preferred and a dividend of 20 cents on the Class A \$1.25 cumulative participating stock. Both dividends are payable May 1 to stock of record April 14. The declaration on the Class A stock, which is not to be construed as a regular rate, is the second payment this year, a dividend of 47½ cents having been paid February 1. After payment on the current 20 cents dividend, accumulated dividends will amount to \$3.55 a share.

Superior Portland Cement, Inc., Seattle, Wash., declared two monthly dividends on the Class A stock at the regular monthly rate of 27½ cents, aggregating 55 cents, both payable May 1 to stock of record April 23. The payment is on arrears and leaves accumulated unpaid dividends of \$1.92½ cents a share.

Limestone Products Corp. of America, Newton, N. J., For 1933: Net loss after depreciation, bad debts, depletion, interest, taxes and other charges, \$12,669.

Lehigh Portland Cement Co., Allentown, Penn., reports for 12 months ended March 31, 1934, net loss of \$434,407 after taxes, depreciation, depletion and obsolescence, comparing with net loss of \$2,164,166 for the 12 months ended March 31, 1933.

Missouri Gravel Co., Moline, Ill., reports less business done in 1933 than heretofore but a substantial profit made. Shipments totaled about 300,000 tons, mostly to Missouri points.

Marquette Stone Co., Dubuque, Iowa, has paid to stockholders 4% of the amount of their stock. The company, organized 12 years ago to quarry and crush rock at Marquette, was sold in August, 1933, to E. C. Schroeder for \$3,000. Capital stock to the amount of \$15,455 had been issued.

Alberene Stone Co., New York City, holding company for soapstone producer with plant in Virginia, has filed a bankruptcy schedule listing liabilities, \$793,448; assets, \$93,618, main items being stock, \$36,805; accounts, \$19,861. Principal creditors listed are Virginia Alberene Corp., \$574,999, secured; New York Trust Co., \$187,500, secured.

Republic Portland Cement Co., San Antonio, Tex., reports for the calendar year 1933: Net income, \$20,545, equal to \$1.89 a share on 10,890 preferred shares, contrasted with net loss of \$94,293 in 1932.

Alpha Portland Cement Co., Easton, Penn., reports for 12 months ended March 31, 1934, consolidated net loss of \$524,507 after taxes, depreciation, minority interest, etc., comparing with net loss of \$1,642,167 for the 12 months ended March 31, 1933.

Current assets as of March 31, last, including \$5,597,340 cash, U. S. Liberty bonds and other marketable securities, amounted to \$7,631,479 and current liabilities were \$344,993. This compares with cash and marketable securities of \$5,544,276, current assets of \$7,571,885 and current liabilities of \$261,032 on March 31, 1933.

Consolidated income account for 12 months ended March 31, 1934, compares as follows:

	1934	1933
Net sales	\$4,186,566	\$3,873,012
Operating expenses	3,422,322	4,208,141
Depreciation	1,421,100	1,409,046
Operating loss	\$ 656,856	\$1,744,175
Other income (net)	121,179	89,219
Loss	\$ 535,677	\$1,654,956
Federal tax		
Minority interest	†11,170	†12,789
Net loss	\$ 524,507	\$1,642,167
Preferred dividends	140,000	140,000
Common dividends		
Deficit	\$ 664,507	\$1,782,167
†Credit.		

New York Trap Rock Corp., New York City, reports for the years ended December 31:

	1933	1932
Gross profit	\$456,623	(*)
Administration selling and general expense	379,879	
Operating profit	76,744	\$860,949
Depreciation	226,065	519,464
Depletion	8,006	12,864
Balance	(d)157,327	328,621
Other income	61,722	
Total income	(d)95,605	328,621
Bond interest	320,944	339,743
Other interest	6,671	23,873
Federal taxes, etc.	42,098	81,197
Reserve for bad debts.	38,093	66,406
Other deductions	16,666	9,105
Minority interest	(cr)12,087	(cr)753
Net loss	517,989	190,951
Preferred dividends		72,520
Deficit for year	517,989	263,471

*Not stated.

Total assets as of December 31, 1933, were \$22,491,037, compared with \$23,091,258 on the same date in 1932. Current assets were \$1,043,406 against \$1,698,350 in 1932. Current liabilities were \$354,564, December 31, 1934, against \$688,525, December 31, 1933. Cash was \$55,231 against \$307,830, the year before.

Marblehead Lime Co., Chicago, Ill., showed a net loss of \$15,170, after interest and other charges, for the year ended November 30, 1933, compared with a net loss of \$86,447 for the preceding fiscal year.

Ideal Cement Co., Denver, Colo., reports for the calendar year 1933: Total shipments showed a decrease of 5.13% as compared to total shipments during the year 1932. The net earnings for the year show a profit of \$150,030.63 after deduction of a charge for depreciation and depletion amounting to \$1,159,105.62. The company paid out in dividends during the year \$343,703.25. However, there was a dividend declared on January 5, 1934, of 25c per share. The net current assets or working capital at the close of the year 1933 amounted to \$9,214,951.01 as compared to \$8,407,171.32 at the close of the year 1932, or an increase in net current assets of \$807,779.69. There was expended for plant improvements and charged to capi-

tal account during the year 1933 the sum of \$47,351.81. The company has continued the policy of purchasing or leasing additional gas and oil properties in Pontotoc and Hughes Counties, Oklahoma, through the Boettcher Oil and Gas Co., a wholly owned subsidiary. Several wells were drilled and completed during the year which added to the company's reserve of natural gas by approximately 20,000,000 cu. ft. In several of the fields in which this development took place, oil has been found in commercial quantities, and it is expected that further development in these fields will be undertaken during the year 1934.

ASSETS	
Cash, industrial and municipal bonds and marketable securities	\$ 7,046,284.32
Accounts receivable	533,478.08
Manufactured goods	548,302.19
Inventory, goods in process, supplies, fuel and sacks	1,288,152.85
Total current assets	\$ 9,416,217.44
Deferred charges	48,114.24
Plants and Properties:	
Plants and equipment	\$23,460,027.54
Less depreciation	8,846,012.58
Land	\$ 1,282,631.42
Less depletion	130,221.77
Total	\$25,230,756.29

LIABILITIES AND CAPITAL	
Liabilities:	
Accounts payable	\$ 78,609.56
Accrued liabilities	122,656.87
Total current liabilities	\$ 201,266.43
Fifteen year 5% convertible gold debentures outstanding	4,146,000.00
Reserves	65,943.86
Stock of sub-companies not owned	10,976.04
Capital:	
Surplus represented by 458,271 shares of no par value common stock	20,806,569.96
Total	\$25,230,756.29

EARNINGS STATEMENT	
Net earnings from operations after depreciation, depletion and federal tax	\$125,669.02
Miscellaneous earnings aside from cement manufacture	231,661.61
Total	\$357,330.63
Less interest paid on debentures	207,300.00
Net earnings	\$150,030.63
Equivalent to profit of 32.7 cents per share for the 458,271 shares of common stock outstanding.	

Recent Dividends Announced

Arundel Corp., com.	
(qu.)	\$0.25 April 2, 1934
Coronet Phosphate (qu.)	1.00 April 20, 1934
Eastern Magnesia-Talcum (qu.) .....	.75 April 2, 1934
Monarch Cement Co.	2% March 15, 1934
Riverside Cement Co., \$6 cum. 1st pfd. (qu.)	1.50 May 1, 1934
Riverside Cement Co., Series A \$1.25 cum. participating .....	.20 May 1, 1934
Santa Cruz Portland Cement (qu.)	1.00 April 1, 1934
Superior Portland Cement, Cl. A (Mo.) ....	.55 May 1, 1934
Superior Portland Cement, Cl. A (accumulative) (np.) .....	.55 May 1, 1934

TRAFFIC and TRANSPORTATION

Proposed Rate Changes

THE FOLLOWING are the latest proposed changes in freight rates up to and including the week of April 14:

New England

32395. To cancel Item No. 17½B of B. & M. R. R. I. C. C. A-2465, which provides a commodity rate of 18½¢ per 100 lb. on broken, ground or unburnt limestone, minimum weight 50,000 lb., North Adams, Mass., and North Pownal, Vt., to various stations in Quebec on the C. N. Ry., and apply in lieu thereof class rates published in B. & M. R. R. I. C. C. A-2465.

32444. Crushed stone (trap rock). (See Note 3), from Westfield, Mass., to Framingham, East Holliston and Holliston, Mass. Present—\$1.10 per net ton; proposed, 90¢ per net ton.

Trunk

32197. Sand, viz.: Blast, core, engine, fire, foundry, glass, moulding, quartz, siliceous or silica, in straight or mixed C. L., (See Note 2), from Althom, Pa., to Durant City, Pa., \$1.20 per net ton. Present rate 6th class. Reason: Proposed rate is comparable with rates on like commodities for like distances, services and conditions.

32210. To cancel commodity rates on sand and gravel, and crushed stone, C. L., from the following origin points, as published in Erie R. R. I. C. C. 19132, to points on Erie R. R., B. & H. R. R., N. J. & N. Y. R. R., N. Y. S. & W. R. R. and W. & E. R. R. and I. C. C. 18482 to connecting lines in Trunk Line territory:

Erie I. C. C. 19132	Erie I. C. C. 18482
Jersey City, N. J.	Jersey City, N. J.
Croton, N. J.	Haskells, N. J.
Ringwood, N. J.	Ringwood, N. J.
Hillburn, N. Y.	White Mills, Pa.
Hawley, Pa.	Honesdale, Pa.
White Mills, Pa.	Avoca, Pa.
Honesdale, Pa.	Hancock, N. Y.
Avoca, Pa.	Silver Springs, N. Y.
Hancock, N. Y.	Almond, N. Y.
Deposit, N. Y.	Ogdensburg, N. J.
Lanesboro, Pa.	Hainesburg, N. J.
Great Bend, Pa.	
Binghamton, N. Y.	
Waverly, N. Y.	
Addison, N. Y.	
Canawaugus, N. Y.	
Silver Springs, N. Y.	
Bloomington, N. J.	
Ogdensburg, N. J.	

Reason: Investigation develops there has been no movement for some time and no prospect of future movement, therefore, rates are obsolete.

7359-1. Rates. Stone, viz., crushed, broken, chatts, etc., as described in Item 920 of W. T. L. Tariff 13-Q. I. C. C. A2331, from Floyd, Ia., to Minneapolis, Minnesota Transfer and St. Paul, Minn. Rates: Present—14¢ per 100 lbs. Proposed—8¢ per 100 lbs.

5435-B. Rates and minimum weight, limestone, ground, C. L., from Alden, Ia., to St. Paul and Winona, Minn., groups. Rates in c. per 100 lb. Present, St. Paul, 16; Winona, 15. Proposed, St. Paul and Winona, 11. Minimum weight, present, 40,000 lb. (See Note 3), but not less than 40,000 lb.

1200-B. Rates: Sand and gravel, C. L., usual minimum weights, from Fairbury, Neb., pits (Blue Valley Sand Spur, Duval Sand Spur, Rock Island Sand Pit Spur and Fairbury).

(Rates in c. per net ton.)

To	Miles	Pres.	Prop.
Stuttgart, Kan.	136	140	112
Prairie View, Kan.	143	140	118
Almena, Kan.	151	150	124
Calvert, Kan.	155	150	124
Norton, Kan.	162	160	130

Rates to expire December 31, 1934. No switching to be absorbed at origin or destination.

32224. Limestone, ground or pulverized, and limestone dust, C. L., minimum weight 50,000 lb., from Jamesville, N. Y., to stations on the M. & E. R. R., \$3.20 per net ton.

Present rate 6th class. Reason—Proposed rate is comparable with rate to Caldwell, N. J.

32225. To cancel commodity rates on sand and gravel, C. L., from LaGrange, Penn., to all points now covered by commodity rates, classification basis to apply. Reason—Investigation develops that no traffic has moved for some time and no prospect of future movement, therefore, rates are obsolete.

32241. Sand and gravel, C. L., (See Note 2), from Kenvil, N. J., to Allentown, Pa., 80¢ per net ton. Present rate 90¢ per net ton. Reason: Proposed rate is comparable with rate from Carpenterville, N. J.

32245. Limestone, unburned ground, C. L., min. wt. 50,000 lbs., from Rosendale and Binnewater, N. Y., to N. Y. C. R. R. stations Yonkers to Stuyvesant, N. Y., inclusive, and Bronxville to Ghent, N. Y., inclusive, rates ranging from \$1.55 to \$2.10 per net ton. Reason: Proposed rates are comparable with rates on like commodities from and to points in the same general territory.

32139. Rock, clay, silt, dirt and sand, C. L., from 37th St. Station, New York, N. Y., to Jersey City to Waverly, N. J., inclusive, \$35 per car. Present rate, sixth class.

32156. To cancel miscellaneous commodity rates from Agent Curlett's Tariff I. C. C. A-412, as shown below:

To cancel in full Item 2485—Gravel, N. O. I. B. N., C. L., rate of 175¢ per 2000 lb., from Allegheny and Vandalia, Pa., to Franklin, Pa.

To cancel partially Item 6720—Sand, viz., moulding, C. L., local and joint rates, in cents per 2000 lb., from Grant, Pa., to group: Beaver, Pa., to Youngstown, Pa., inclusive, via routes given in Item 270 of the tariff.

To cancel partially Item 6785—Sand, viz., moulding, C. L., rate of 17¢ per 100 lb., from Garovi, Pa., to Toronto, Weston and Guelph, Ont., and rate of 22½¢ per 100 lb. from Garovi, Pa., to Owen Sound, Ont.

To cancel partially Item 6790—Sand, viz., other than blast, engine, foundry, glass, moulding or silica, C. L., rate of 175¢ per 2000 lb., from Allegheny, N. Y. (P. R. R.), to Franklin, Pa.

To cancel partially Item 6795—Sand, viz., other than blast, engine, foundry, glass, moulding or silica, and gravel, C. L., from Machias, N. Y., to Ripley, N. Y., rate of 110¢ per 2000 lb. To cancel from the tariff and republish in P. R. R. I. C. C. 244, consolidating structure.

To cancel partially Item 6840—Sand, C. L., rate of 9½¢ per 100 lb., from Allegheny, N. Y. (P. R. R.), to Franklin, Pa., and rate of 125¢ per 2000 lb., from Irvine Mills, N. Y., to Corry, Pa.

To cancel in full Item 6940—Sand, viz., blast, engine, foundry, glass, moulding, sea and silica, joint rates in cents per 2000 lb., from Irvine Mills, N. Y., to group: Agincourt, Ont., to West Toronto, Ont., inclusive.

To cancel partially Item 7000—Sand, blast, building, common, engine, foundry, glass, moulding, quartz, siliceous and silica, C. L., rate of 11½¢ per 100 lb., from Dagushahonda, Pa., Pa., to Thorold, Ont.

To cancel partially Item 7045—Sand, viz., blast, engine, foundry, glass, moulding, quartz, silica or siliceous, C. L., rate of 189¢ per 2000 lb., from Allegheny, N. Y. (P. R. R.), to Franklin, Pa.

Central

39071. To cancel rating of 60%, 80% and 83.33% of sixth class, also graduated scales of ratings on agricultural limestone, crushed, ground or pulverized limestone, limestone dust, stone, ground or pulverized, marl, agricultural, ground or natural, published in Items 2350 to and including 2450, also Items 3705 and 3710 of C. F. A. L. Tariff No. 130-V, from, to and between points in C.F.A. territory, also to Trunk Line and Canadian Freight Assn. territories, account obsolete.

Note 1—Minimum weight marked capacity of car.

Note 2—Minimum weight 90% of marked capacity of car.

Note 3—Minimum weight 90% of marked capacity of car, except that when car is loaded to visible capacity the actual weight will apply.

39105. To establish on agricultural or pulverized limestone, in bags or in bulk in box cars, C. L., minimum weight 80,000 lb., from Sibley, Mich., to Newberry, Mich., rate of 222 per net ton.

39098. To cancel rates on sand and/or gravel, from Emison, Gravel Pit and Hazleton, Ind., to points in Illinois on the C. C. C. & St. L. Ry., published in C. & E. I. Ry. Co. F. T. No. 505-A, account obsolete.

39124. To cancel obsolete rates as shown below on dolomite, crude or raw; stone, furnace and stone, fluxing carloads, published in Section No. 3 of C. & O. Ry. Freight Tariff 2143B:

(a) Furnace stone, C. L., from Carey, O., to Columbus and So. Columbus, O., 126¢ per G. T.

(b) Dolomite, crude or raw, C. L., from Carey, O., to Jackson and Wellston, O., 166¢ per G. T.

(c) Dolomite, crude or raw; stone, furnace and stone, fluxing, C. L., from Carey, Hamden, Marion and Owens, O., to Wellston and New Straitsville, O.

Also cancel all other commodity rates published from C. F. A. producing points to above mentioned destinations on these commodities.

39191. To establish on gravel, stone and slag, as provided in Item 330 of N. Y. C. R. R. Tariff 1461-B, from Jackson, Mich.:

To Bucyrus, Ohio—*Present, 18¢; proposed, 176¢ N. T. Routing to be provided—N. Y. C. R. R. direct.

Bryan, Ohio—*Present, 13¢; proposed, 119¢ N. T. Routing to be provided—C. N. R. R. direct.

To Bowling Green, Ohio—*Present, 15¢; proposed, 142¢ N. T. Routing to be provided—N. Y. C. R. R. direct.

To Defiance, Ohio—*Present, 15¢; proposed, 142¢ N. T. Routing to be provided—C. N. R. R., Sherwood, B. & O., N. Y. C. R. R., Toledo, Wabash.

To Findlay, Ohio—*Present, 17¢; proposed, 153¢ N. T. Routing to be provided—N. Y. C. R. R. direct.

To Fremont, Ohio—*Present, 16¢; proposed, 153¢ N. T. Routing to be provided—N. Y. C. R. R. direct.

To Kenton, Ohio—*Present, 18¢; proposed, 176¢ N. T. Routing to be provided—N. Y. C. R. R. direct.

To Lima, Ohio—*Present, 17¢; proposed, 176¢ N. T. Routing to be provided—N. Y. C. R. R., Adrian, D. T. & I., N. Y. C. R. R., Toledo, B. & O.

To Napoleon, Ohio—*Present, 15¢; proposed, 142¢ N. T. Routing to be provided—N. Y. C. R. R., Adrian, D. T. & I., N. Y. C. R. R., Toledo, Wabash.

To Ottawa, Ohio—*Present, 17¢; proposed, 153¢ N. T. Routing to be provided—N. Y. C. R. R., Adrian, D. T. & I., N. Y. C. R. R., Toledo, B. & O.

To Paulding, Ohio—*Present, 15¢; proposed, 142¢ N. T. Routing to be provided—C. N. R. R. direct.

To Port Clinton, Ohio—*Present, 17¢; proposed, 153¢ N. T. Routing to be provided—N. Y. C. R. R. direct.

To Tiffin, Ohio—*Present, 17¢; proposed, 153¢ N. T. Routing to be provided—N. Y. C. R. R., Toledo, P. R. R.

To Toledo, Ohio—*Present, 14¢; proposed, 130¢ N. T. Routing to be provided—N. Y. C. R. R. direct.

To Upper Sandusky, O.—*Present, 18¢; proposed, 176¢ N. T. Routing to be provided—N. Y. C. R. R., Toledo, C. & O.

To Wauseon, Ohio—*Present, 14¢; proposed, 142¢ N. T. Routing to be provided—N. Y. C. R. R. direct.

*Sixth class.

39198. To establish on sand (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, moulding or silica) and gravel, C. L., from Peru, Ind.

To	*Present	Proposed
Mentone, Ind.	12¢ cwt.	75¢ N. T.
Tippencanoe, Ind.	12¢ cwt.	75¢ N. T.
Rutland, Ind.	12¢ cwt.	75¢ N. T.
Hibbard, Ind.	12¢ cwt.	75¢ N. T.
Burr Oak, Ind.	13¢ cwt.	75¢ N. T.
Cber, Ind.	13¢ cwt.	80¢ N. T.
Knox, Ind.	13¢ cwt.	80¢ N. T.
Brems, Ind.	13¢ cwt.	85¢ N. T.

*Sixth class.

39229. To establish on granulated slag, C. L., in open top equipment, from Cleveland, O., to Walford, Penn., rate of 90¢ per N. T. Route—Via P. R. R. direct. Present—14¢ (6th class) per C. F. A. L. Tariff I. C. C. 2444.

39246. To amend Rule 70 (C) of C. F. A. L. Tariff 311-E, publishing transit privileges on feed at Toledo, Ohio, and similar items in other tariffs of agents and individual lines naming transit privileges on feed to read as

follows: "Less C. L. quantities of poultry grit, oyster shells and/or crushed limestone for poultry feeding purposes, in bags, may be forwarded in mixed carloads of feed, prepared, animal, poultry or pigeon, at the carload rate from the transit point and applicable to such feed." Present: Bold face portion of the above proposal represents additions to the present rule.

39248. To establish on **granules, roofing**, consisting of crushed or ground brick and/or burned clay or shale, C. L., min. wt. 90 per cent of marked capacity of car, but not less than 60,000 lb., from Danville, Ill. Rates in cents per net ton. To Cincinnati, O., proposed rates, *170; present rates, 210. Franklin (Warren Co.), O., proposed rates, *175; present rates, 220.

*Applies via C. C. C. & St. L. Ry. (N. Y. C. R. R., Lessee), Ansonia, O., Cincinnati, N. Y. R. R.

*Applies via C. C. C. & St. L. Ry. (N. Y. C. R. R., Lessee) direct through Fairland, Ind., and Valley Junction, Ohio.

39266. To establish on **crushed stone and crushed stone screenings**, C. L., from Kokomo, Ind., to Tipton, Ind., rate of 50c per net ton. Route: Via N. Y. C. & St. L. R. R. direct. Present, 60c via N. Y. C. & St. L. R. R. direct; 48½c via Indiana R. R. direct.

39271. To establish on **gravel and sand**, except blast, core, engine, filter, fire or furnace, foundry glass, grinding or polishing, loam, moulding and silica, C. L., from Killbuck, O., rates in c. per net ton.

To	Proposed	Present
Apple Creek, O.	50	60
Big Prairie, O.	60	85
Brink Haven, O.	40	60
Greer, O.	50	85
Holmesville, O.	40	50
Howard, O.	50	60
Loudonville, O.	60	85
Lucas, O.	80	85
Melco, O.	60	85
Shreve, O.	80	85
Smithville, O.	60	80

Route: Via P. R. R. direct.

39272. To establish on **crushed stone, crushed stone screenings and agricultural limestone** (not ground or pulverized) in bulk, in open top cars, C. L., from Bluffton, Ind., to Garrett, Ind., rate of 85c per net ton. Present, 12c (sixth class). Route: Via N. Y. C. & St. L. R. R., Ft. Wayne, Ind., and I. S. C.

39273. To establish on **crushed stone, crushed stone screenings** in bulk, in open top cars, C. L., from Lima, O., rates in c. per net ton.

To	Present	*Proposed
New Bremen, O.	60	50
Minster, O.	60	50
Celina, O.	60	50
Coldwater, O.	60	50

*To expire June 30, 1934.

Route: Via N. Y. C. & St. L. R. R. direct.

39276. To cancel all rates on **sand**, viz., blast, core, engine, filter, fire or furnace, foundry glass, grinding or polishing, loam, moulding or silica, C. L., in open top cars and in box cars, from Rush Run, O., to destinations in Ohio, as named in P. R. R. Tariff Ohio F-1445, and to all destinations in C. F. A. territory as shown in P. R. R. Tariff I. C. C. 59, account obsolete, class rates to apply in lieu thereof.

39283. To establish on **sand** (other than blast, core, engine, filter, fire or furnace, foundry glass, grinding or polishing, loam, moulding or silica), and **gravel**, in open top equipment, C. L., from Lodi, O., to points in Ohio located on connecting lines within a radius of 105 miles, rates on basis prescribed by the Interstate Commerce Commission in I. C. C. Docket 25020. Present rates—Classification basis (sixth class).

39286. To establish on **sand** (except blast, core, engine, filter, fire or furnace, foundry glass, grinding or polishing, loam or silica), and **gravel**, C. L., to Kokomo, Ind., from Peru, Ind., rate of 50c per N. T. Present—60c per N. T.; 48½c per N. T.

39287. To establish on **crushed stone, crushed stone screenings**, in bulk, in open top cars, C. L., (See Note 2), except when car is loaded to full cubical or visible capacity actual weight will apply, from Bluffton, Ind., to Huntington, Ind., rate of 70c per N. T. Route—Via Kingsland, Ind., and Erie R. R. Present rate—75c per N. T. per N. Y. C. & St. L. R. R. Tariff 584-H and Wab. Ry. Tariff I. C. C. 6609.

39347. To establish on **sand** (other than blast, core, engine, filter, fire or furnace, foundry glass, grinding or polishing, loam, moulding or silica) or **gravel**, in open top cars, C. L., from Burbank, O., to Mansfield, O., rate of 60c per N. T. Present: 95c per N. T.

39348. To establish on **sand, blast, core, engine, filter, fire or furnace, foundry glass,**

grinding or polishing, loam, moulding or silica, C. L., from Detroit, Mich., to points in the Dominion of Canada, rates the same as now in effect from Wyandotte, Mich. (Item 3450 and 3610A, C. F. A. L. Tariff 347-B.)

Illustrations of Present and Proposed Rates (Rates in c. per net ton.)

To	Proposed	*Present
Agincourt, Ont.	325	373
Barry's Bay, Ont.	540	588
Belleville, Ont.	375	423
Brockville, Ont.	425	473
Montreal, Que.	425	473
C. Hawa, Ont.	325	373
Quebec, Que.	565	613
St. John, N. B.	715	763
Sherbrooke, Que.	490	538
Sydney, N. S.	815	863

*Per Items 3325 and 3495 of C. F. A. L. Tariff 347B.

39327. To establish on **limestone, agricultural, unburned** (not ground or pulverized); **crushed stone screenings; crushed stone**, straight or mixed C. L., in bulk in open top cars only, (See Note 3), from Marblehead, Ohio.

To	Proposed	Present
	N. T.	Cwt.
New Paris, Ind.	145c	19c
Milford, Ind.	145c	19c
Leesburg, Ind.	145c	19c
Mentone, Ind.	155c	20c
Akron, Ind.	155c	20c
Gilead, Ind.	155c	20c
Chilli, Ind.	155c	20c
Peru, Ind.	165c	20c
Winona Lake, Ind.	145c	19c

No fourth section via L. & M.—Danbury—N. Y. C. R. R.—Elkhart, Ind., C. C. C. & St. L. Ry.—Warsaw, Ind., and Winona R. R.

Southern

4573. **Limestone**, granulated, ground or pulverized, C. L., Sparta, Tenn., to Richmond, Va., for large movement beyond. Present rate, 350c. Proposed rate on limestone, granulated, ground or pulverized to a fineness to pass through a screen of five-sixteenths inch mesh, in bulk in bags, C. L., minimum weight 60,000 lb., from and to aforementioned points, 310c per net ton (to expire July 31, 1934, unless sooner canceled, changed or extended).

4604. **Stone**, crushed, C. L., Boxley, Va., to Pennsylvania R. R. stations in Virginia. It is proposed to establish rates on crushed stone, C. L., from Boxley, Va., to P. R. R. stations in Virginia same as in effect on gravel from Warmore, Pa.

4615. **Sand, gravel, slag, crushed, rubble or broken stone, and chert**, C. L., (a) between points on the Chesterfield & Lancaster R. R. on the one hand and points on the S. A. L. Ry. on the other. (b) Between points on the C. & L. R. R. on the one hand and points in S. F. A. territory on the other. (c) Between points on the C. M. & C. R. R. and R. & C. R. R. on the one hand and points in S. F. A. territory on the other. It is proposed to amend Agent Speiden's I. C. C. Nos. 1635 and 1784, and publish rates on roadway material, C. L., as described therein, on both interstate and intrastate traffic in South Carolina, applicable from and to points on the Chesterfield & Lancaster R. R., Charlotte, Monroe & Columbia R. R., and Raleigh & Charleston R. R., on joint-haul traffic, to be on the trunk-line joint-line scale basis, i.e., Scale 2, published in Agent Speiden's I. C. C. Nos. 1635 and 1784, referred to above.

4688. **Stone**, crushed, C. L., Latham, Ky., to Hartford, Ky. (intrastate). Present rate, 90c. Proposed rate on crushed stone, C. L. (See Note 3), from Latham to Hartford, Ky. (intrastate), 70c per net ton (to expire June 30, 1934, unless sooner cancelled, changed or extended).

4699. **Stone or brick** (roofing granules), crushed, ground or pulverized, C. L., Cincinnati, Ohio (when originating beyond), to Mobile, Ala., and New Orleans, La. Present rate, class or combination. Proposed rate on stone or brick (roofing granules), crushed, ground or pulverized, C. L., minimum weight 80,000 lb., from and to above mentioned points, 300c per net ton.

4719. Cancellation—**stone**, crushed, C. L., Pekin, Va., to Virginia and North Carolina points. It is proposed to cancel, on the obsolete theory, the present rates on the above named commodity from and to the points in question published in N. & W. Ry. I. C. C. Nos. 8635 and 8255—combination rates to apply after cancellation.

4734. Rates suggested by carriers—**Limestone or marble**, crushed, granulated, ground or pulverized, including stone dust and marl, C. L., Florida points to points in S. F. A. territory. It is proposed to revise rates on ground limestone, etc., from interior Florida

points to Southern territory, published under Table 3, Section 2, Part 1, of Agent Speiden's I. C. C. 1676, by eliminating Florida arbitrations.

4784. **Stone**, crushed, C. L., Rock Spring, Ala., to Leatherwood, Alexandria, Wellington, Reads Mill, Cobb City and Glencoe, Ala. (intrastate). It is proposed to establish reduced rates on stone, crushed, C. L., (See Note 3), from Rock Spring, Ala., to Leatherwood, Alexandria, Ala., 35; Wellington, Reads Mill, Cobb City and Glencoe, Ala., 30c per net ton. (To expire August 31, 1934, unless sooner canceled, changed or extended.)

Southwestern

3066. **Limestone**, crushed or ground, from Mosher and Ste. Genevieve, Mo., to Omaha, Neb., and Council Bluffs, Ia. To establish rate of 285c per ton of 2000 lb. (See Note 2), from Mosher and Ste. Genevieve, Mo., to Omaha, Neb., and Council Bluffs, Ia., to enable these Missouri shippers to compete with such points as Hannibal, Mo., Chicago, Ill., St. Paul, Minn., and Valmeyer, Ill.

3121. **Limestone**, crushed or ground, from Carthage, Mo., to Grand Island, Neb. To establish rate of 245c per ton of 2,000 lb., on limestone, crushed or ground (See Note 2), from Carthage, Mo., to Grand Island, Neb., to enable Carthage to compete with such points as Weeping Water, Neb., in furnishing limestone to the Grand Island, Neb., sugar plant.

Texas-Louisiana

1007-TX, Subject 9223-TX. **Crushed stone**, from Richland to Midlothian and Venus, extending expiration date: Proposition from carriers to extend expiration date Item 7841, Supplement MM, Tariff 2-L, until June 30, 1934. Due to unfavorable weather conditions job for which this rate was established cannot be completed by March 31, the present expiration date.

8177-5-TX. **Sand**, C. L., from Columbus to San Antonio. Proposition to establish rate of 78c per ton of 2000 lb. to expire concurrently with rate from West Point to San Antonio, Item 7854, Sup. LL, Tariff 2-L now published to expire with June 30, 1934. Rate applies only to San Antonio proper. If delivery is made on tracks of lines other than the T. & N. O. in San Antonio the switching charge of such other lines shall not be absorbed, but shall be in addition to the rate provided above. Proposed rate to permit sand shippers at Columbus to compete with those at West Point.

Illinois

3339-6-A. **Crushed stone, gravel and/or sand**, coated with oil, tar or asphaltum, C. L., from Aurora, Ill., to I. R. C. points, to establish following mileage scale of rates:

	Rates per Net Ton
25 miles and under.....	\$1.16
40 and over 25.....	1.27
60 and over 40.....	1.39
75 and over 60.....	1.50
100 and over 75.....	1.62
125 and over 100.....	1.73
150 and over 125.....	1.96
175 and over 150.....	2.08
200 and over 175.....	2.19
225 and over 200.....	2.31
250 and over 225.....	2.42
275 and over 250.....	2.54
300 and over 275.....	2.77
325 and over 300.....	2.88

7720-A. **Sand and gravel**, C. L., from Aurora, Ill., to DeKalb, Ill. Present, 63c net ton. Proposed, 48c net ton.

7753. **Agricultural limestone**, C. L., from Valley City, Ill., to Joliet, Ill. Present—Class or combination. Proposed—\$1.39 net ton.

Western

8414. (Dkt. Bn. 3449, 3482, 3494)—**Sand**, viz., blast, core, engine, filter, fire or furnace, etc., C. L., from Ottawa, Ill., Brownton, Wis., Muscatine, Ia., Pacific, Mo., and Bowes, Ill., to Kansas City, Mo., Twin Cities, Charles City, Ia., Omaha, Neb., Cedar Rapids, Ia., etc. Approved the proposal of Docket 8414 and Sup. 1.

774. (Dkt. Bn. 3537)—**Stone, crushed; stone, rubble**, of irregular random widths, lengths and thicknesses, C. L., from Rapid City, S. D., to St. Paul, Minneapolis and Minnesota Transfer, Minn. Approved docketed proposal.

1665. (Dkt. Bn. 3499)—**Stone, crushed or ground; chatts** (lead or zinc mine refuse); **rip rap; rubble stone; strippings** (stone), sand, gravel, etc., C. L., between Hannibal, Mo., and stations in Iowa. Approved docketed proposal.

2079-S. **Stone, crushed**, C. L., minimum weight 10 per cent less than marked capacity of car, except when loaded to full visible capacity, in which event actual weight will govern, from Ablemans and Red Granite, Wis., to Minneapolis, St. Paul and Minnesota Transfer, Minn. Rates: Present—7c per 100 lb. Proposed—6c per 100 lb.

6146-O. (Dkt. Bn. 3350). **Stone, crushed or ground**, C. L., between stations in Kansas or Missouri and stations in Arkansas, Kansas, Louisiana (west of the Miss. River), Missouri, Oklahoma and Texas. Approved the following rule for publication in Item 15 of S. W. L. Tariff 162 and similar items in W. L. Tariffs 154, 164, 210 and 237:

"The rates in this tariff are subject to (See Note 3) the following exceptions:

"(1) When a shipper orders a car of 80,000 lb. or greater marked capacity, and the carrier is unable to furnish car ordered and furnishes a car of greater capacity than ordered, the minimum weight for the car furnished shall be that which would have obtained had the car ordered been furnished and used.

"(2) Applicable only on ground limestone in box cars. When a shipper orders a car of 60,000 lb. or greater marked capacity, and the carrier is unable to furnish car ordered and furnishes a car of greater capacity than ordered, the minimum weight for the car furnished shall be that which would have obtained had the car ordered been furnished and used."

I.C.C. Decisions

25407. Sand and Gravel. By Division 3. Reed and Wheelock vs. Chicago, Burlington and Quincy R. R. Rates in C. L., from Oreapolis, Nebr., to Prescott, Ia., found not unreasonable. Complaint dismissed; rate on like traffic to Bedford, Ia., found not unreasonable in the past but unreasonable in the future. Reasonable rates prescribed.

23416. Molding Sand. Crane Enamelware Co. vs. Baltimore and Ohio R. R. By Division 3. Upon reconsideration findings that rates charged from New York points to Chattanooga, Tenn., were inapplicable in part, modified. Certain applicable rates affirmed as unreasonable. Reparation awarded.

25846. Cement Products. Federal-American Cement Tile Co. vs. Indiana Harbor R. R. By Division 3. Rate on reinforced concrete or cement roofing slabs in C. L., from Hammond, Ind., to Niles Center, Ill., found unreasonable. Reparation awarded.

25135. Gravel. By the Commission. Supplemental report modifies prior finding so as to accept from the order (191 I. C. C. 351) sand and gravel from Kenova to Lavellette, W. Va., between September 12 and 30, 1933.

Overcharges Claimed

EFFORTS TO OBTAIN refunds from alleged overcharges on gravel freight rates recently were instituted by H. C. Fields, chairman of the Public Service Commission, and by the Parker Gravel Co., Shreveport, La. The Louisiana-Arkansas Railroad is named defendant.

A similar suit by the gravel concern also was filed by the Missouri Pacific Railroad

Co. The amount of overcharges claimed is between \$65,000 and \$75,000.

Southern Rates Cut

THE GEORGIA Public Service Commission in April announced a general revision of intrastate railroad rates on sand and gravel and other aggregates. Reductions range well beneath the old rates in effect since March, 1930, with extra charges for joint line shipment eliminated.

Roadwork Contracts Affect Rate Decision

APPPLICATION of various railroads in Nebraska for authority to establish a distance scale of rates on sand and gravel and crushed stone recently was dismissed by the railroad commission, "without prejudice to a later application."

The commission said: "The evidence shows that contracts in excess of \$5,000,000 already have been let for road work in 1934. These contracts have been bid on and accepted on the basis of our previous rate order . . . In view of this situation it is our opinion that the scale rates prescribed by their order should not be disturbed."

Tennessee Phosphate Industry Awakening After Late Spring

DURING the enforced inactivity caused by a late, icy spring, several options on phosphate land in Williamson County, Tennessee, which have been carried through the depression at extremely low prices by one of the large phosphate interests, were closed up, according to report, though no actual transfer is known to be on record, and one of the most active eras of mining phosphate and organizing a phosphate boom (all in the newspaper columns so far) that has taken place in some time has been under way in the city of Franklin.

The various chroniclers have consolidated some of the largest fertilizer companies, the Swan Chemical Co., and the TVA, and have included the large steel companies, to install a four million dollar plant for the purpose of making steel at Franklin out of the newly (?) (1899) discovered phosphate deposits in Williamson county, but it is believed that much of the report, like that of the Irishman's death, is slightly exaggerated.

Another report comes of the development of a phosphate deposit in Franklin county, south of Tullahoma, which was discovered a number of years ago, but at that time it was not profitable to mine it, while now the better (?) price obtainable, and the splendid highways, affording easy trucking operations, makes it profitable.

It is doubtful if there is a single county in the Middle Basin where some phosphate does not exist, and most of the Highland Rim counties and some on the western slope of the rim, have fine deposits, but all of them are known. The problem is not to find phosphate, but to develop something to do with

it, and while making steel out of it might be a very attractive outlet from the tonnage standpoint, it is hard to believe that even this could excel the use for fertilizing purposes as a consumer.

As long as potential new users employ entirely new people in their investigations instead of the ones long in the business, news columns will be filled with new discoveries and new uses. Meantime, owners of good phosphate lands are looking for buyers, and prices are still low.

No change is reported in market or price conditions or in code being yet completed. With the cessation of CWA payrolls last week, the patriotic phosphate mining labor will again unanimously do its part to make phosphate rock cheap for the fertilizer industry and the electric furnace producers of phosphoric acid, as it has been doing for the past five or ten years.

Progress on Public Works Highways

PROGRESS made on emergency construction of public works highways to April 14 under the supervision of the U. S. Bureau of Public Roads shows a total of 7,213 projects, estimated to cost \$359,241,000, had been advertised for contract, begun by day labor employed directly by the highway authorities, or completed. The cost of the day labor projects included in the above is estimated at \$24,944,000.

Of the 6,460 projects awarded for construction, 4,387 were under construction on April 14, and 965 were completed. The work under construction, which is estimated to cost \$254,674,000, was giving regular employment to 124,728 men.

In the whole country, work under way and completed involved 84.1% of the \$400,000,000 provided for public works highways under Section 204 of the NIRA.

PWA Acts to Protect Material Producers

HAROLD L. ICKES, administrator of PWA, issued an executive order to all Federal departments and construction agencies to prevent the common practice of subcontractors and material men being chiseled by contractors after the opening of bids. The order reads:

"Every contractor who bids upon a project financed in whole or in part by loans or grants from the PWA shall submit in a sealed envelope with his bid to the contracting authority the names of all subcontractors and their bids upon which his bid is based. The sealed envelope so submitted shall have on it the name of the contractor with the words thereon 'Bids of Subcontractors.' Such submission shall be deemed to constitute on acceptance by the contractor, if awarded the contract, of the bid of each subcontractor. Any alteration therein, after the award of the contract, shall be subject to the approval of the PWA engineer."

Digest of Foreign Literature

By F. O. Anderegg, Ph. D.
Consulting Specialist, Pittsburgh, Pa.

Portland Cements Rich in Magnesia.

An interesting research is described by Prof. Hans Kühl and Ernst Ludwig Meyer of the Berlin Technical High School. Among cementing materials containing appreciable amounts of magnesia may be found: natural cements which are burned without sintering and are sound; slightly sintered cements which develop their unsoundness within 28 days; and completely sintered cements which may develop unsoundness only after several years of water storage. Prof. Kühl had made up a series of experimental cements using a standard portland mix to which he added increasing amounts of MgO. The four cements contained 2, 6, 12 and 18% MgO. The tensile strength seemed to be more sensitive to the strains developed as the MgO hydrated than the compressive. The second cement showed retrogression in tensile strength after 3 years, the third after 1 year, and the fourth after 90 days, while only the last one suffered any perceptible loss in compressive strength and that between 3 and 5 years.

In the experimental investigation, the fact was first established that MgO when burned between 800 and 1400 deg. C. does not react with ammonium acetate in the Emley method for determining free lime. Then three mixes were made up of pure chemicals: the first free from iron, the second with 3.1% iron oxide, and the third, where equivalent amounts of iron oxide and alumina (4.9 and 7.7%) were present. To each of these 20% of magnesia was also added, both as MgO and as $MgCO_3$. In the first one, a white cement, the magnesia improved the clinkering very markedly; added to the second, it helped to a certain extent; but as for the third, so much iron was present that the effect of the magnesia was masked. Burns were made at 800, 1050, 1260, 1400, 1460 deg. C. for 30 minutes. The maximum lime was set free at the second temperature and fell to a minimum at the highest temperature. At the higher temperatures the white cements contained most free lime and the high iron cements least free lime. In the former the magnesia appears to help the binding of the free lime, but its assistance was negligible when iron was present. To explain this, it is suggested that in the presence of iron that spinell may be formed. This assumption was supported by determining the insoluble residue in the samples burned at 1150 deg. Since the carbonate seemed to be more effective than the oxide in this respect, it was suggested that decarbonization left a more active material.—*Tonindustrie Zeitung* (1934) 58, No. 1, p. 6; No. 3, p. 27; No. 4, p. 40.

Separation and Determination of Calcium and Magnesium

AN improved method for the separation of calcium oxide and magnesium oxide, which is said to be rapid and accurate and to have a wide application, is described by A. C. Shead and R. K. Valla in a recent issue of *Industrial and Engineering Chemistry*. It is called the 8-hydroxyquinoline-saccharate method.

Silica and oxides of iron and aluminum are removed in the usual way. From the hot filtrate, calcium as oxalate and magnesium as 8-hydroxyquinolate are precipitated together by the addition of the calculated amount of 8-hydroxyquinoline dissolved in the required quantity of a hot solution of oxalic acid previously saturated in the cold. The calcium precipitates first from the slightly acid solution. The solution is then gradually made alkaline with ammonium hydroxide until about 10% by volume has been added, and allowed to stand until precipitation is complete (an hour or two). The mixed precipitate is filtered off on paper and washed with 2 to 5% ammonium hydroxide, ignited to the mixed oxides in a porcelain crucible containing a piece of platinum foil, and weighed. In case the material under examination is a limestone or dolomite, the weighing as mixed oxides can be omitted, as it is much more convenient to obtain these data by a titration of the unburned limestone which seldom carries such impurities as would vitiate the alkalimetric titration. The freshly ignited mixed oxides are then extracted with 30% saccharate solution. The extraction and washing of the residual insoluble magnesia are rapid provided that treatment at this point is prompt, as standing admits of the hydration of magnesium oxide to magnesium hydroxide which is colloidal in nature. Filtration of magnesium oxide is rapid and hence the solution needs no protection from carbon dioxide in the air. If magnesium hydroxide is formed, additional apparatus is required to exclude the carbon dioxide. The extraction and washing should not require more than 15 to 20 minutes, as the solution of freshly ignited calcium oxide is rapid and the mixture is not an intimate one because the bulk of the calcium is precipitated out in slightly acid solution before the magnesia precipitates in the strongly alkaline environment.

Manufacturers of the Non-Metallic Minerals in Canada, 1930-1932: 128 pp.; Canadian Department of Trade and Commerce, Bureau of Statistics. Gives statistics of production, number of plants, capi-

tal employed, number of employees, salaries and wages, cost of fuel and electricity, value of products, of principal rock products, 1928-1932, inclusive.

Standard Classification of Feldspar

IN REPORTING on standard classification of feldspar, B. C. Burgess, manager, Tennessee Mineral Products Corp., and chairman of the standing committee, says that when the classification for feldspar (CS23-30) was drawn up it was realized that there might be points which would need revision from time to time, so provision was made for annual meetings to consider recommendations for revision.

To clear up questions that have been raised he says:

(1) The commercial standard does not interfere with existing grades. Chemically its scope covers the entire range of alkali feldspars. Physically it covers the full range of particle sizes in general use in the ceramic industry. Its effect is felt to be rather toward giving an adequate and comprehensive means of classifying the existing grades according to the SiO_2 content and the ratio between alkalis.

(2) Individual consumers' specifications are in most cases a help to the feldspar producers, and all of them welcome individual specifications from their customers and adhere to them as far as possible. However, all of these specifications can be classified according to the commercial standard grades, though the commercial grade may be wider than the individual specification. The individual specification then serves as a supplement to the standard.

(3) The physical classification according to particle size is a remarkably close specification as to grinding. However, it represents limits which are commercially practical to maintain on all of the types of grinding equipment now in use for grinding feldspar. At the time the standard was drawn up it was realized that additional grain sizes might need to be added to complete the physical classification. To determine the extent of this classification a large number of sieve analyses of feldspar ground and classified in different types of equipment were shown to be maintained on the finer meshes down to 325 mesh. In consideration of these data the committee decided to allow the original size classification to stand rather than to complicate the standard by specifying limits on finer sieves.

Public Hearing on Open-Price Selling in Mineral Aggregate Industries

(Contributed)

ALTHOUGH open-price selling methods are already established in most of the live districts under the Code of Fair Competition for the Crushed Stone, Sand and Gravel, and Slag Industries, the NRA decided a public hearing should be held for the benefit of any objectors. The Code provides that any district, subject to the approval of its regional committee and the Code Authority, may establish open-price selling, uniform terms of sale, standard credit practices, discounts, etc., but when it came to writing rules in specific instances the NRA took the attitude that these rules might extend the code rather than supplement it, and that to be legally binding an open hearing must be held and the rules approved by NRA, in the same manner as was the original code. Hence, a public hearing was held in Washington, D. C., April 5. C. L. Hickling, deputy administrator, presided at the session, aided by R. E. Plimpton, assistant deputy administrator, as well as the customary corps of legal, labor, consumer, and industrial advisors.

After the representative of the legal department had outlined the procedure to be followed at the hearing, the deputy administrator called upon Otho M. Graves, chairman of the Code Authority of the Crushed Stone, Sand and Gravel, and Slag Industries, to make any general statements which might aid in completing the record of the hearing. Mr. Graves stated that it should be understood that the Code Authority was not presenting evidence directly, but that the district committees were charged with the responsibility of formulating the rules and regulations for their particular districts. He mentioned that the Code Authority, of course, had approved these rules, after they had been scrutinized by the regional committees. Mr. Graves emphasized one point; namely, that effective operation of the code depends upon strict adherence to terms by all members of the three industries concerned. He wished it clearly understood that stabilization of the industries does not mean standardization of price; the district committees are asking only for uniformity of selling methods and of credit practices, not uniformity of price.

Representatives of districts from four regions were present at the hearing to state their respective cases. Mr. Graves represented, by proxy, Districts 1 and 3 of Region 1, as well as Districts 1, 2, 3, and 4 and the northern district of Region 15. W. R. Sanborn, chairman of the regional committee for Region 9, spoke for Districts 1, 2, 3, and 4, and his remarks were supplemented by the district committee chairmen. John Prince, chairman of the regional committee for Region 13 presented rules and regulations for the districts in his region.

Rules and Regulations Similar

Although there are numerous minor variations in the rules and regulations submitted by the various districts, all contained essentially the same provisions. In Region 9, which comprises four districts, identical rules and regulations have been adopted, with one exception. In District 1, the Chicago area, payment is required on the 10th day of the month instead of the 16th. The following 11 rules were presented by Mr. Sanborn in behalf of the four districts in his region:

The following rules and regulations shall become effective within ten days after approval by the Administrator and upon being so approved shall be binding upon all producers selling within the District as provided in Sections 3 and 4, Article VII of the Code, and any deviation therefrom shall constitute an unfair trade practice in violation of the Code.

Rule 1. All prices on materials filed with District Committee by any producer selling within the District shall be based on a net ton of 2000 pounds.

Rule 2. The District Committee elects that the producers selling within this District shall file prices with the District Committee on one or both of the following bases:

(a) Prices f.o.b. cars, docks, vessels, or trucks at such specific points or destinations as the producer selling within the District may elect, these prices to be changed only by filing new prices with the District Committee not less than 5 days in advance of the effective date thereof.

(b) Prices f.o.b. cars or vessels at a specific plant or dock, these prices to be changed only by filing new prices with the District Committee not less than 5 days in advance of the effective date thereof.

Rule 3. Each producer selling within the District shall file with the District Committee his plant and/or storage yard prices for all classes of materials loaded in trucks, and may change such prices only by filing with the District Committee new prices not less than 5 days in advance of the effective date thereof.

Rule 4. No provision contained in Rules 2 and 3 shall be construed as preventing any producer selling within a District from meeting, without filing, the prices, terms, and conditions of sale, as of their effective date, filed by any other producer.

Rule 5. All prices must be filed in writing, which shall be stamped with a time stamp upon receipt by the Secretary of the District Committee and the period of notice shall be computed therefrom.

Rule 6. No producer selling within the District shall make secret or confidential disclosure of prices which are to be filed subsequently.

Rule 7. No change in prices or new lower prices may be filed to become effective so as to apply on any project after bids are received on such project.

Rule 8. The trade practices embodied in Sections 1, Article VII of the Code shall be strictly adhered to.

Rule 9. All contracts of sale, written or verbal, except contracts with governmental units and railroads, shall be uniform as to terms and credit practices, as set forth in

the uniform quotation and contract blank attached hereto and forming a part of these rules and regulations and the uniform terms and credit practices prescribed therein shall apply on all sales or orders for products of the industries governed by the Code.

Rule 10. All producers shall file with the Secretary of the District Committee a complete list of all contracts, or obligations now outstanding upon which deliveries will be made under terms, conditions, or prices other than those made effective by the open price policy.

Rule 11. In the event that complaint of violation of these rules and regulations is made in writing to the Secretary of the District Committee, then the said Secretary shall immediately notify the producer against whom the complaint is submitted, and shall further set a date for a hearing by the District Committee which shall be held not sooner than ten days and not later than fifteen days from the date of notice to the producer against whom complaint is made.

The committee has also recommended the adoption of a uniform quotation contract blank for use in connection with the open price policy. A facsimile of this blank is given here.

The rules submitted by Mr. Graves of District 1 in Region 1 are similar to those proposed by the districts in Region 9. The most striking difference is that the New England districts include detailed provisions regarding administration and enforcement of the rules, whereas these provisions are omitted from the rules herein quoted.

Few Protests Received

Harold Williams, speaking for District 2 of Region 1, outlined the developments leading up to adoption of the rules for his district. He stated that a few producers had objected to Rule 1 which establishes a net ton of 2,000 lb. as the unit in which all materials must be sold. Small producers claimed that it would be a hardship on them because of the necessity of buying scales. The majority of producers in the district, however, claimed that the practice was common now and that it should be encouraged. Mr. Williams mentioned that several of the rules adopted by his district were merely restatements of provisions in the Code, and that they were presented in order to complete the procedure. The rules provide for blank contract forms numbered serially to be issued to each producer. By this device the district committee will know that all contracts are being filed. Mr. Williams pointed out that in some districts all producers may not agree to filing contracts with the district committee, and in that case a separate impartial auditing board might be set up to conduct this phase of the work.

Mr. Williams said that no formal protests had been received against the rules and regulations proposed for District 2, and that all

except minor differences had been settled prior to the public hearing.

Mr. Sanborn outlined the procedure used in publicizing the work of the district committees in Illinois and Indiana. He stated that notices had been sent to 250 companies in these two states and as many more in adjacent states, and further that more than 1,000 consumers, including states, counties, cities, contractors, and building supply dealers, had been notified of the proposed adoption of the set of rules.

A few protests were received in connection with the rules in Region 9. M. Moss Alexander, president, Missouri Portland Cement Co. (a sand and gravel producer), stated that the contract blank as proposed was inadequate to protect either the consumer or the producer. He stated further that allowing 5c a ton discount for payment before the 16th of the month opened the door for cheating, and that there was no way to police such a provision. He objected also to the clause which allows 30 days for the acceptance of a quotation by the purchaser, stating that it preferably should be limited to 15 days.

The Indiana Gravel Co. complained that the quotation sheet does not cover truck shipments properly and that detailed provisions relating to freight rates are not applicable to plants shipping by truck. This company stated further that on truck shipments a discount of 10c should be allowed, 5c on material and 5c on trucking charges.

The Louisville Cement Co. (crushed stone producer), although agreeing in general to the rules, objected to filing reports with the secretary of the district committee because he happens to be a competitor. The officials stated, however, that they would be glad to file their reports with any impartial agency and that their records were open at any time to the Code Authority. The Louisville Cement Co. also objected to the clause which provides that processing, manufacturing, and sales taxes should be added to the invoices, contending that only federal taxes should be included, because any difference in state taxes might work a hardship upon producers marketing in several states having variable tax levies.

A letter from the American Aggregates Corp. stated that the code allows either plant or delivered prices to be quoted, but that Rule 3 limits quotations to plant prices only.

In reply to these protests Mr. Sanborn stated that a careful reading of the code and the rules will reveal no conflict between methods for quoting prices as expressed in the code and in the rules. W. H. Sanders, chairman of the committee of District 4, pointed out that all the matters on which protests were received had been discussed thoroughly at meetings held within the district and that the rules represent compromises which were accepted by all in order to arrive at the will of the majority, and that the protests had been received from persons and companies who were not sufficiently interested to attend the district meetings. E. Guy

UNIFORM QUOTATION AND CONTRACT BLANK FOR USE IN CONNECTION WITH THE OPEN PRICE POLICY ADOPTED BY DISTRICT COMMITTEE OF DISTRICT NO....., REGION NO....., PURSUANT TO THE CODE OF FAIR COMPETITION FOR THE CRUSHED STONE, SAND AND GRAVEL, AND SLAG INDUSTRIES.

(Name of Producer)

(Location of Office)

(Date of quotation)

....., herein called the Seller, quotes and agrees to sell and furnish to.....

(Name of producer)

(Name of purchaser)

....., herein called the Purchaser, the quantity of.....

(Office address)

materials hereinafter described, on the terms and conditions hereinafter set forth, to be used on the following project only:

Description of project:

MATERIALS, DELIVERIES, AND PRICES

Description and Quality of Materials:

Period of Delivery:

Maximum Daily Requirements:

Point of Origin:

Destination:

Price per ton:

TERMS AND CONDITIONS

Freight Rates: Prices quoted f.o.b. destination are defined as being f.o.b. point of origin with freight allowed to destination and are based on the present or duly authorized freight rate from the plant of the Seller, at the aforesaid point of origin, and any subsequent advance or decrease in said freight rate shall increase or decrease the delivered prices accordingly.

Payment of Freight Charges: All freight bills are to be paid by the purchaser. In the event the Seller advances the freight, the Purchaser shall make payment for such prepaid freight upon receipt of invoice therefor, which shall be rendered by the Seller within forty-eight (48) hours from time of such prepayment.

Change of Origin: The Seller reserves the right to ship from other than the designated origin without change of quoted price.

Invoices: Invoices shall be rendered by the Seller and payments made by the Purchaser on the basis of railroad weights when deliveries are made by rail. Invoices for deliveries other than by rail shall be rendered on the basis of just and reasonable weights determined in a manner mutually agreeable to the Seller and the Purchaser.

Taxes: All processing, manufacturing, and sales taxes, becoming effective after the date of this quotation shall be added to the invoices and paid by the Purchaser.

Terms of Payment: Net cash on the 16th day of the month for all deliveries of materials during the preceding month. A discount of 5c per ton will be allowed the purchaser if payment is made on or before the 15th day of the month for all deliveries of materials during the previous month, and no discount shall be allowed after that date. In no case shall waiver of lien be given by Seller prior to the receipt of full payment of account for that part of the project for which waiver is requested.

Financial Responsibility: If at any time the financial responsibility of the Purchaser becomes impaired or unsatisfactory to the Seller, the Seller reserves the right to require payments in advance, or satisfactory security or guarantee that invoices will be paid promptly when due.

Contingencies: The Purchaser agrees to give the Seller shipping instructions a reasonable time before deliveries are to be made, and the Seller shall not be responsible for delays in shipping caused by labor difficulties, breakdowns at plants, inability to secure transportation facilities, weather conditions, or other contingencies not under control of the Seller.

Acceptance: The acceptance of this quotation by the Purchaser in writing, within thirty days from its date and when executed by the Seller, shall constitute a contract of sale between the Purchaser and Seller.

Accepted by the Purchaser this..... day of.....19.....

(Name of Purchaser)

By

(Title)

Quotation submitted by

(Name of Seller)

By

(Title)

Contract executed by Seller this.....

day of.....19.....

(Name of Seller)

By

(Title)

Sutton pointed out that the cement industry commonly allows a discount similar to that in the proposed rules and that it did not seem reasonable for the cement companies to protest against the same procedure in connection with their crushed stone sales.

Agricultural Limestone Shippers Exempt

Mr. Sanborn explained that because of radical differences in marketing practices, shippers of agricultural limestone, as well as chemical and metallurgical limestone, should be exempt from the rules and regulations. He stated that this might be accomplished

easily by amending Rule 9 to include "except contracts covering sale of agricultural limestone, metallurgical limestone, and chemical limestone." He stated that he personally favored this change because his company was among those which might be handicapped if their sales of these special products were covered by the rules. His suggested change was endorsed by Messrs. Sutton, Sanders, and McDermott, district committee chairmen of Region 9.

Conversion Table in Missouri

John Prince, chairman of the regional committee of Region 13, stated that he had

authority to speak for the nine districts in his region but that three had not yet submitted rules, because the districts, although desirous of adopting the open price policy, have been blocked by one or two large producers who are not able as yet to agree with the majority. Mr. Prince outlined the procedure that was followed in giving publicity to the meetings at which the rules were formulated, and stated that the committees attempted to follow literally the provisions established in the code. The resultant rules, according to Mr. Prince, were essentially the same as others already presented, with one possible exception. In District 1 of Missouri a difference in weight of materials in direct competition with each other, necessitates adjustment in order to allow heavier materials to compete with lighter ones on a price basis. For this reason the rules include a conversion table which is to be used by the producers in quoting prices.

Mr. Prince reported that no protests had been filed from Region 13.

Small Producers Object to Tons

The proposed rules and regulations for the districts in Region 15 (California) were presented by Mr. Graves. They also were similar to those considered earlier in the hearing, and no question was raised regarding any of their provisions. Mr. Plimpton read into the record two letters of protest from representatives of small producers in Southern California. Their contention was that most small producers have no scales, and the necessity of purchasing scales would be a financial hardship. They urged amendment of the rules to allow sales of material by cubic yards if agreed to by consumers. In order to complete the record on the short ton vs. cubic yard controversy, Mr. Graves summarized the situation by stating that an accurate measured yard might be acceptable, but the practice now was to load a truck and guess at the yardage. He emphasized the fact that the common occurrence of billing a six-ton truckload of material as five tons was unfair competition, and that all materials should be weighed accurately and billed exactly. He cited the coal industry as an example of this practice, and concluded by stating that the cost of new scales should not exceed \$1300 and that second-hand scales could be bought even cheaper, and that any producer who could not procure facilities for weighing his material should not sell in the open market.

The deputy administrator asked Mr. Graves if he felt that everyone has had opportunity to realize what adoption of these rules and regulations will mean to producers and consumers. Mr. Graves replied that he was entirely sympathetic to the viewpoint of the administrator but he sincerely felt that this had been done properly. All producers, of course, had not attended the meetings and objections might be raised by those not in attendance, but, as Mr. Graves pointed out, everyone had been given an opportunity to

have a voice in the preparation of the rules, and those who were not sufficiently interested to attend the meetings certainly had no just cause to object after the rules were in effect.

The opinions of the NRA, of course, were not expressed at the hearing, but the undercurrent of comment seemed to indicate an

unsympathetic attitude. No doubt additional conferences with the administration will be necessary to arrive at a conclusion regarding the adoption of the particular open price plans submitted, and the results of these conferences will be awaited with much interest by all concerned.

Gypsum Product That Sells for 60 Cents Per Pound

W. A. HAMMOND, Yellow Springs, Ohio, announces the commercial production of "Drierite," an anhydrous calcium sulphate, or gypsum. This product and its various uses has been described by Dr. Hammond and Dr. James R. Withrow in *Industrial and Engineering Chemistry*, June and October, 1933 (see *ROCK PRODUCTS*, October 25, 1933, p. 24). Recently Dr. Hammond described his product in a paper before the American Chemical Society at its annual meeting in St. Petersburg, Fla.

Dr. Hammond first became interested in gypsum in 1919 while serving as chemist for the Castalia Portland Cement Co. After that he was for five years chief chemist of the United States Gypsum Co. In 1925 he organized the reclaiming and marketing of plaster casting moulds in the Ohio ceramic industry, and as a member of the faculty of Ohio State University and Antioch College has been working on gypsum ever since. His product is patented (U. S. P. No 1,887,349). It is sold in powdered form and in granular sizes from $\frac{1}{2}$ to $\frac{1}{8}$ in. average diameter, in 1 to 5 lb. glass containers and 5 to 50 lb. metal containers. In 1 to 5 lb. lots it sells at 60¢ per lb., f. o. b., Yellow Springs, Ohio.

The uses of Drierite are as an all-purpose desiccant (dehydrator); for drying solids, liquids, gases; its field is in laboratories and in industry for solvent recovery, production of anhydrous liquids, drying industrial gases and air conditioning.

The maker claims:

- (1) It is easily and repeatedly regenerated.
- (2) It is neutral, stable, and chemically inactive toward other reagents than water.
- (3) It is insoluble in, and inactive toward, all organic liquids; yet it removes water instantly and completely from all such liquids.
- (4) Its drying efficiency for gases is high, the moisture remaining in air after drying with Drierite at 25 deg. to 30 deg. C. is 0.005 milligrams per liter (original figure checked by Bureau of Standards).
- (5) It shows little change in efficiency with rise in temperature up to 100 deg. C.
- (6) It is rapid in its absorption of water, being able to dry gases flowing at high velocities.
- (7) On absorption of water it reverts to a definite hydrate, $\text{CaSO}_4 \cdot \frac{1}{2} \text{H}_2\text{O}$; its efficiency is therefore maintained until it has absorbed 6.6% of its weight of water.

(8) The granular forms contain 38% by volume of pore space. Capillary absorption accompanies hydration, giving a total absorption capacity in moist air at normal temperatures of 12 to 14% of its weight.

(9) It does not become wet on exhaustion nor crystallize to the walls of desiccators, towers, or tubes. In industrial installations it may be regenerated in place indefinitely.

(10) It does not shrink, expand, nor disintegrate on absorption of water, nor develop channels through absorption columns.

(11) It is available in large quantities and at low cost.

The United States Bureau of Standards recently completed a four-year survey of the efficiency of commercial drying agents, and in this survey the Bureau checked exactly the efficiency figures obtained by Dr. Hammond in his tests, which showed that air dried by this desiccant contains only 0.005 milligrams of moisture to the liter. This figure places Dr. Hammond's compound fourth among the 15 commercial drying agents. However, the three more efficient agents have limited usage, while Dr. Hammond's is the most versatile known.

The basic ingredient of Dr. Hammond's compound, the mineral gypsum, is made up of calcium sulphate and water. The gypsum is heated cautiously for three hours in an oven at 230 to 250 deg. C., or about 460 deg. F. This process yields a reactive form of the sulphate.

Lime at Pennsylvania Farm Show

FOUR CONCERNS interested in selling lime products to the quarter of a million visitors who attended the 18th annual Pennsylvania Farm Show at Harrisburg, this year, had attractive exhibits and were much gratified with the increased interest shown by agricultural buyers.

Whiterock Quarries, Bellefonte, had a large working model of their quadruple separation plant used in producing the high grades of spraying and dusting lime. Ray C. Noll, general manager and E. B. Bower, sales representative were in charge.

Universal Gypsum and Lime Co., York, was represented by Harry G. Hoehler, sales manager and Walter Hamme.

American Lime and Stone Co., Bellefonte, sent John Curtin, assistant sales manager, and Norman Bentz to meet its old customers and get new ones.

Rock Products News Briefs

Conference of the Lime Industry

A GENERAL CONFERENCE of the lime industry, to which all lime manufacturers are invited, and the 16th annual convention of the National Lime Association will be held at the Edgewater Beach hotel in Chicago, Ill., May 23, 24 and 25. Special hotel rates and special round-trip railway fares have been provided for. As an added attraction the Century of Progress, Chicago World's Fair, will reopen for the 1934 season on May 26, immediately following the close of the convention.

Probably most of the time of the convention will be devoted to a number of important matters relating to the code of fair competition for the industry. The rest of the program will be devoted to papers and reports by the association staff.

Silicosis Act Proposed in New York Legislature

A bill to include silicosis among the industrial diseases under Workman's Compensation Law has been introduced in both houses of the New York State Legislature. The bill is sponsored by the Department of Labor and was drafted after a series of conferences with insurance companies, employers and labor.

Several hundred silicosis suits with damage claims exceeding \$1,000,000 have been filed recently in state courts.

Under the terms of this bill, silicosis is divided into two stages. The first stage is characterized by definite and specific signs of the disease but not to the extent of causing total disability. The bill provides that, when a worker is suffering from silicosis in the first stage, he may be awarded occupational disability compensation up to \$1000 while he is finding other employment outside the silica dust hazard field. If he elects to remain in employment exposing him to silica dust, he may receive up to \$2000 compensation upon signing a waiver for himself, dependents or beneficiaries of all further claims. Workers would be eligible to compensation for silicosis when they have been exposed to silica dust, under a contract of employment existing in this state, over a period of not less than five years, two years of which shall have been in the state and not less than one year of which shall have occurred after this act shall have taken effect. If the employee has been with the same employer during the whole five-year period, his right to compensation shall not be affected if he has done work for his employer outside the state for part of that period.

Compensation for second stage silicosis, characterized by definite fibrosis of the lungs causing total disability, shall not exceed \$25 per week nor be less than \$8 per week and the period of compensation shall not exceed

260 weeks, making the maximum award \$6500.

The last employer of a worker awarded compensation for silicosis shall be liable for the entire compensation except when an employee upon employment willfully and in writing deceives the employer by stating that he has not previously suffered from the disease.

Because of the special and difficult nature of silicosis and its symptoms, the bill provides for the appointment by the Industrial Commissioner of three physicians with special experience and qualification in diagnosing silicosis to examine all persons claiming compensation for silicosis.

Claims for disability compensation or death benefits shall be made within two years after date of disablement or death from silicosis. Compensation shall not be payable for any period preceding the date of claim.

Employers are required to provide proper medical treatment or attendance for employees disabled by silicosis up to a period of 60 days and longer if the Industrial Board believes it will be beneficial.

Recent Rock Products Prices Bid and Contracts Let

Dayton, Ohio: City Commission bought 1000 tons of bank sand from **Moraine Gravel and Sand Co.** at \$1.25 per ton, and 500 tons of lake sand from building supply dealers at \$2.15 per ton.

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Knoxville, Tenn.: Cement, costing \$661,050, was ordered by the Tennessee Valley Authority on March 31 for use in constructing the Norris and Joe Wheeler dams. A total of 215,000 bbl. was purchased for Norris dam, about one-fourth of the amount required to build it. Orders were placed as follows: Volunteer Portland Cement Co., Knoxville, 125,000 bbl.; Pennsylvania-Dixie Cement Corp., Kingsport, Tenn., 45,000 bbl.; Signal Mountain Portland Cement Co., Chattanooga, Tenn., 45,000 bbl. A total of 100,000 bbl. was ordered for the Joe Wheeler dam, about one-sixth of the ultimate requirement. Orders were placed as follows: Lehigh Portland Cement Co., Birmingham, 35,000 bbl.; Alpha Portland Cement Co., Birmingham, 35,000 bbl.; and the Cumberland Portland Cement Co., Cowan, Tenn., 30,000 bbl. The average price per bbl. is about \$2.10, delivered.

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Chariton, Iowa: The Leonard Lumber Co. has been awarded a contract to supply the city with 300 cu. yd. of filter bed sand. The purchase amounts to approximately 405 tons, at a per ton cost of \$1.98. Only local firms were asked to submit bids. Those of Eikenberry & Co. and of the Chariton Lumber & Supply Co. also listed a \$1.98 price. Both, however, had but recently furnished

the city with supplies and for that reason the contract was given to the Leonard firm.

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Winchester, Ky.: county court awarded contract to **Central Rock Co.** for crushed chips for resurfacing at \$1.85 per ton.

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Michigan City, Ind.: Five Laporte county concerns have been awarded contracts to supply the county highway department with gravel during 1934, as the result of action taken recently by the county commissioners. The prices vary from 30 to 69c per cu. yd. for pit run gravel, from 78 to 90c for maintenance gravel, 90c for concrete gravel, 40c for sand, 55 to 94c for pea gravel, and 75 to 80c for washed gravel. The successful bidders were **Charles Chesak, Cook Brothers, Sherman Cumerford, C. D. Smelser and Zigler Brothers.** The **Modern Improvement Co.** of South Bend, obtained the contract for Colprovia sheet asphalt at \$10.50 a ton and for asphaltic concrete at \$10 a ton.

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Jamestown, N. Y.: Bids for materials for county road work were opened at a meeting of the Highway Committee of the Board of Supervisors. On the item of 5000 bbl. of portland cement, bids were received from eight cement companies, all quoting a price of \$2.22 per bbl. Companies submitting bids were: Universal Atlas Cement Co. of Pittsburgh; Huron Portland Cement Co., Detroit; Lone Star Cement Co., New York; Alpha Portland Cement Co., Easton, Penn.; Federal Portland Cement Co., Buffalo; Medusa Portland Cement Co., Cleveland, O.; Pennsylvania-Dixie Cement Corp., Buffalo; Bessemer Cement Corp., Youngstown, O. Bids of stone, slag, sand and gravel were received from the A & K Builders Supply Co. of Jamestown; Shore Acres Sand & Gravel Co., Jamestown; Buffalo Slag Co., Buffalo; Federal Crushed Stone Co., Buffalo; Jamestown Macadam Co., Jamestown; LeRoy Lime and Crushed Stone Co., LeRoy; Dunkirk Dock Corp., Dunkirk; Olean Gravel Corp., Olean; Buffalo Gravel Corp., Buffalo. Because some gave a base bid at the pits and quarries and others gave the delivered price to the various parts of the county, the figures for aggregates had to be audited to obtain a basis for comparison.

Much Larger Rail Movement of Rock Products Predicted

ESTIMATES of 13 shippers' regional advisory boards show expected shipments of sand, gravel, crushed stone and slag in the second quarter of 1934—April to June, incl.—will exceed the same quarter of 1933 by 14.4%; cement by 20%; lime and plaster by 15%. This is pretty good evidence that all branches of the construction industry are becoming active again.

An 8-In. Suction Dredge of Recent Design*

Built for Commercial Aggregate Production, Serves Equally Well for Channel Dredging

NOT MANY new sand and gravel dredges have been built in the last two years, and during that time several commercial sand and gravel operators have used their idle equipment on government channel dredging jobs. Most of the dredges used for channel dredging are much larger than 8-in. suction, but the dredge described here is that size, and it was designed for commercial aggregate production, but it has served equally well for channel dredging.

The dredge described here was built in 1932 for the Interstate Sand and Gravel Co., Norfolk, Va., an associate company of the Commonwealth Sand and Gravel Co., of Richmond and Norfolk, for its new plant on the south branch of the James River, about 10 miles south of Norfolk.

The design was worked out to include the use of materials which could be supplied locally; is of all wood construction. The hull is of tide-water, heavy timber design. It has a plain suction pipe line operated from a fixed position boom, for side-swing maneuvering. The entire dredge is handled with power lines running through lead sheaves on the lower mid-position of the boom.

An 8-in. "Amsco" Type "C," Form 30, left hand, bottom discharge, heavy duty dredging pump, using a heavy sleeve bearing and equipped with "S.K.F." angular contact ball thrust bearing, is used for the production of excavated materials. The pump is direct-connected to a 125-hp., Westinghouse, 40 deg. C., type "CW" slip-ring design of motor, of 585 r.p.m. full load speed, 3-phase, 60 cycles, 440 volts; equipped with a continuous duty design resistor and drum type controller, controls providing for 50% speed reduction variation based on full load r.p.m. A No. 12 Francke flexible coupling is used between the shafts of the pump and motor. The pump and motor unit with its electrical controls provides extreme flexibility over a wide range of operating head conditions.

The water end parts are all made of manganese steel, of heavy proportioned design, accurately machine-finished by grinding, where necessary, to assure correct fit when replacements are required. The combination assembly of the shell, side plates and their renewable liners, and the impeller, embodies distinctive design features, providing easy flow passages, which give maximum hydraulic efficiency and solids capacity. The impeller embodies ample inside wall face width and properly proportioned eye open-

ing entrance diameter; it is provided with exclusively Amsco designed vane curvature features, is accurately balanced, and is attached to its shaft by pressed fit and key.

The main bearing, of sleeve design, comprises simplicity of construction, with maintained accuracy of shaft alignment. It has large babbitted bearing surface area and adequate free-flowing oiling facilities, together with a large oil reservoir. The housing carriage fits the top of the pedestal in a planed-way and is held to the pedestal by six large size capscrews, fitting elongated or slotted holes of the carriage. The entire bearing and pump shaft portion assembly can be moved in directions parallel to the axis of the shaft by means of a hand-manipulated, screw-jack adjustment on the pump parts end of the pedestal. This bearing construction provides ability to attend easily to the accurate adjustment of the impeller.

The dredge pump and motor unit are placed in a cockpit well, providing minimum elevation of shaft center-line above pond water-level. The hull portion of the suction pipe line is horizontal, from the pump suction side plate opening, with a clean-out handhole fitting next to the pump. The hoist is mounted on a raised platform above the deck, straddling the hull portion of the suction pipe line. It provides a convenient operator's platform with centralized controls for hoist lever quadrant stand, hoist motor controller, and dredge pump motor controller. This view outlines the simple manner of service water piping details; all electrical wiring is incased in conduits. Provisions have been made for ample lighting and ventilation. The operator has close-up, clear vision, well above the front end of the dredge.

When the dredge was digging the channel, the materials were carried through the discharge pipe line, mounted through its entire length on pontoons of barrel-type construction, to its emptying position in low, marshy waste land, where the materials excavated were used for fill purposes. In the excavation of the deposit for commercial sand, the materials are carried through the discharge pipe line system, the pontoon portion to the shore, and then over land to the emptying point at the screening plant. From there the materials are scrubbed, washed, rinsed, classified, and dried, where required, in a complete and modern screening plant.

All dredge equipment is individually powered by electric motors. For the regular sand excavation work, electrical energy is brought to the dredge by a single cable of three-wire system, from a shore transformer

station, carried on the pontoons, where required, from the shore position to the dredge. The wiring installation shown in the views for the channel excavation program was a temporary set-up of three individual wire system mounted on poles with cross tees. The voltage brought out to the dredge is 440, which is led to a master switch box and then to the several motor controls. The lights' voltage, of 115, is obtained with a transformer connected with the 440-volt master service line.

The hoist is a Clyde heavy duty, three-drum dredge design, with one main drum and two pony drums, powered with a 10-hp. slip-ring motor provided with variable speed controls. The main drum is used for raising and lowering the suction pipe line and the two pony drums are used to attend to the combination of side swing and head pull of the dredge; 5/8-in. diameter wire rope is used on all drums.

The service water pump is a Goulds 2-in. size, single-stage, centrifugal type, powered with a 10-hp. squirrel-cage motor of constant speed characteristics. Ample water capacity at effective pressure is furnished for quick priming, seal purposes at the stuffing box position of the dredge pump, and possible emergency fire-fighting requirements.

The hull size is of over-all dimensions, 40 ft. 0 in. long, 20 ft. 0 in. wide and 3 ft. 8 in. deep; the deck plan is rectangular in shape, with 2 in. crown. The side, fore and aft gunwales are of 6 in. x 12 in. and 6 in. x 16 in. timbers. Two through fore and aft bulkheads of heavy timber construction are used, their inside wall faces being 10 ft. 10 1/2 in. apart, equally spaced with reference to the main hull center-line. The bulkheads form a portion of the cockpit well for the dredge pump and its motor, the length being 16 ft. 0 in. Nine heavy floor beams, placed thwartships, add to the structural strength of the hull. All parts have been adequately connected with bolts to uprights, all gunwales and bulkheads having been assembled with drift pins; 2 1/2 in. x 8 in. decking, pieces running fore and aft, is used. The planking is 3 1/2 in. x 12 in. and the pieces are placed thwartships. The hull has been provided against teredo activity by being armor covered—first coated with creosote oil paint, then sheathed with heavy tar paper, and finally covered with boards 1 1/2 in. thick, which were thoroughly impregnated with a preservative process.

The outside dimensions of the cabin are 32 ft. 5 in. long, 15 ft. 0 in. wide and 10 ft. 8 in. to the roof eaves. The front

*Data furnished by Arthur Blakemore, engineer, American Manganese Steel Co., Chicago Heights, Ill.

*End
view
of the
dredge
unit*



wall sets back 4 ft. 6 in. from the front gunwale and 3 ft. 1 in. from the aft gunwale. Side walkways are 2 ft. 6 in. wide.

Special Roof Design

The accompanying sketch outlines the simple framing details, together with the unique roof construction, which is curved.

The top of the A-frame is 23-ft. 0 in. above deck, with 11 ft. 0 in. inside spread of legs. It is of triangular construction bolted to an adjacent rectangular frame.

The upright legs are bolted to the bulkheads.

Twin Members in Boom to Give Maximum Strength

Ins'tead of the usual practice of using one heavy timber for the boom, this boat uses two thin timbers, size 4 in. x 12 in., and 36 ft. 0 in. long. They are bolted together at the heel position, making a total beam cross-section size of 8 in. x 12 in. In the middle and at the point sheave end, spacer

filler blocks are bolted in place between the timbers, which give a bowed or sprung type of construction. This arrangement gives maximum strength with the least weight, together with unique point sheave enclosure and rope path.

Engineers of the pump department, American Manganese Steel Co., designed all details of this dredge. Arthur Blake-more, one of the company's representatives, supervised the general layout. A. P. Cofield, general superintendent for the Interstate



*General
view
of the
dredge
in
channel*

Sand and Gravel Co., supervised its field erection and installation. All construction work was done on the local plant property.

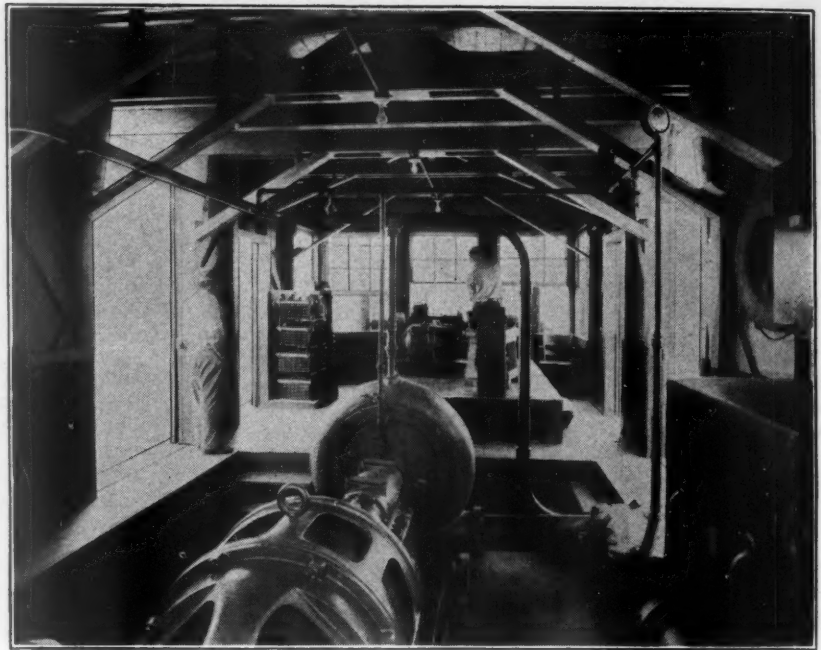
Lime and Gypsum Fertilizers

CODE OF FERTILIZER industry contains the following provisions:

Maximum work week of 40 hours for all employees except foremen, superintendents, managers, salesmen and officials, with a tolerance provision that during planting season if there is a shortage of available labor, employees, with their consent, may work not to exceed 60 hours in any one week and not to exceed 40 hours a week average over a period of four weeks. Repair crews and similar classifications are also given a tolerance of 10%. Time and one-third is to be paid for overtime, and each employee is entitled to one day of rest every week. Minimum wages are fixed at not less than 35 cents an hour in the northern area, 25 cents an hour at port and 20 cents at interior points in the south, 35 cents in the midwestern area, 40 cents on the Pacific coast. With respect to distribution through co-operative associations of farmers the code says: "Notwithstanding the provisions of this code, any arrangement upon sale, consignment or agency basis between producers and

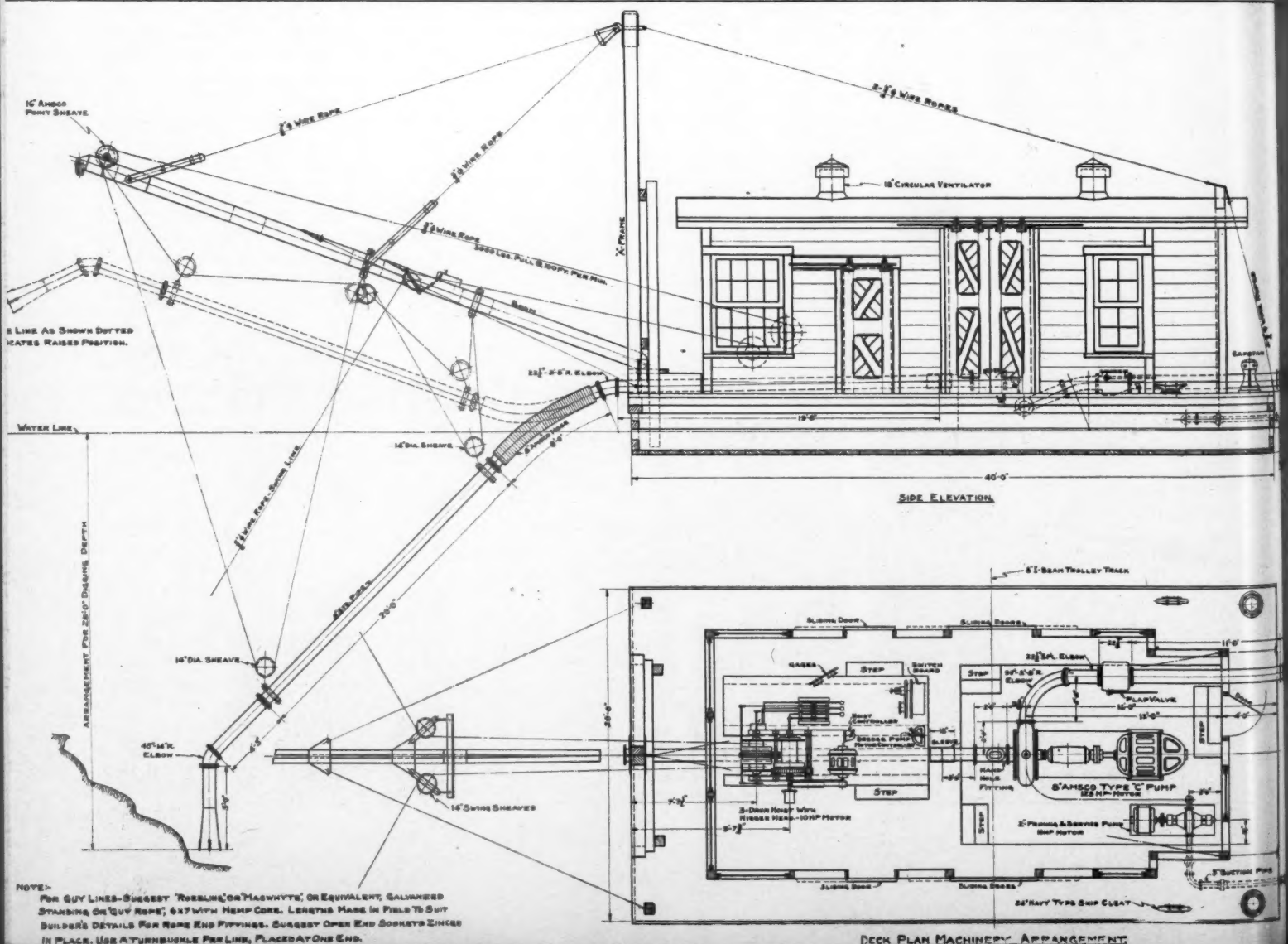
regularly incorporated state wide co-operative farmers' organizations, or their sub-divisions or departments, granting special rates, commissions or concessions or the division of profits, may be continued, entered into or performed, pro-

vided, however, that it shall be obligatory upon such co-operative organizations to maintain the producers' schedule of prices to their dealers and consumers in the areas covered. Farmers co-operatives may also pay patronage dividends."



Cabin view of pump and motor unit

General design of 8-in. pump hydraulic dredge of Interstate Sand and Gravel Co., Norfolk, Va.



Rock Products News Briefs

Cement

Statistics: The portland cement industry in March produced 5,257,000 bbl., shipped 4,618,000 bbl. from the mills and had in stock at the end of the month 21,401,000 bbl. Production showed an increase of 42.7% and shipments an increase of 31.6%, as compared with March, 1933. Portland cement stocks at mills were 0.5% higher than a year ago. The total production for the first quarter of 1934 amounts to 13,204,000 bbl., compared with 9,419,000 bbl. in the same period of 1933, and the total shipments for the first quarter of 1934 amount to 11,348,000 bbl., compared with 8,290,000 bbl. in the same period of 1933; increases, respectively, of 40.2 and 36.9%. In the following statement of relation of production to capacity the total output of finished cement is compared with the estimated capacity of 163 plants at the close of March, 1934, and of 165 plants at the close of March, 1933.

RATIO (PER CENT) OF PRODUCTION TO CAPACITY

	March		Febru-	Janu-	De-
	1933	1934	ary	ary	cember
	1933	1934	1934	1934	1933
The month...	16.1	23.0	20.2	16.6	15.5
The 12 months ended	26.7	25.0	24.4	23.9	23.6

Wage Increases at portland cement plants in various parts of the country were announced, effective April 1.

Tennessee Valley Authority: Rumors persist that TVA will make its own cement at Muscle Shoals. Commenting on these rumors recently at Chattanooga, Tenn., Blaine S. Smith, president of the Pennsylvania-Dixie Cement Corp., is quoted by local newspapers as follows: "Cement has not gone up in price in the same proportion as other commodities. Cement companies have been running in the red for two years, and the current prices are too low to earn an adequate return on their capital investment. Cement certainly is not selling at too high a price."

The Penn-Dixie president said he believed the TVA would, after investigation, find that a cement plant at muscle shoals would be workable only to supply projects within a close radius, and would not help with more distant jobs, such as the construction of Norris dam.

"The state of Texas started several years ago to build its own cement plant," Mr. Smith said, "but found out that the plant would be feasible only to supply a very small territory immediately surrounding it. Cement is a cheap and heavy product. If the government made cement at the Muscle Shoals plant, which is designed now for the manufacture of lime, any advantage in cost would be burned up by freight charges to a point as far away as Norris dam.

"As far as I know, only three governmental units—the city of Los Angeles and

the states of South Dakota and Michigan—have ever operated their own cement plants, and in every one of these instances the result was disastrous."

The private cement plants in the Tennessee valley have a production capacity four or five times greater than the present demand, and greater than the heaviest demand ever experienced in boom times, Mr. Smith said. These private plants, he said, are owned by stockholders and bondholders who are residents of the valley.

Landa Portland Cement Co., Puebla, Mex., has been granted a concession to build and operate a short-line railway to stations on the Puebla Industrial Ry. and the inter-oceanic division of the National Railways of Mexico. Work on the railway will begin at once.

Alpha Portland Cement Co., La Salle, Ill., has contributed the use of enough ground to provide subsistence gardens for 250 gardeners.

Marquette Cement Manufacturing Co., Chicago, Ill., announces, effective March 31, D. S. Colburn, formerly assistant to the president, has been promoted to be vice-president; Leonard W. Saxby, formerly purchasing agent, has been promoted to be assistant to the president.

Volunteer Portland Cement Co., Knoxville, Tenn., on March 30 announced it would close the following day for lack of orders. On March 31 it received an order for 125,000 bbl. from TVA, and the shut-down did not occur, much to the relief of the local population.

San Francisco, Calif.: By stipulation of counsel for plaintiffs and defendants in the suit brought by the Pacific Portland Cement Co. to void a contract for high silica cement for the south pier of the Golden Gate bridge, Judge Maurice T. Dooling of San Benito county, has been nominated to sit in all matters pertaining to trial of the suit. The action is against the Santa Cruz Portland Cement Co., the bridge and highway district, contractors and individuals.

Arkansas Portland Cement Co., Okay, Ark., and **Monarch Cement Co.,** Humbolt, Kan., were two of the creditors of the State of Arkansas for highway materials. Recently the state refunding board allowed various claims, to be paid half in cash and half in 3%, 20-yr. bonds, including about \$12,000 to the Arkansas company and \$41,000 to the Monarch company.

Marquette Cement Manufacturing Co., Chicago, Ill., on March 26 submitted the only bid for 1,600,000 bbl. of cement to be

used by the state in its road building program for 1934 (previous bids had been received). Eight other companies explained that as a matter of fixed policy they would bid only on a delivered price basis and not f. o. b. mill, as requested in the specifications. The bidder asked an average of \$1.3964 per bbl., with prices slightly higher or lower, depending on the county in which the cement is to be used. The average price for cement, on a delivered basis, asked by eleven companies in the bid of February 9, which is still under advisement, was \$1.84. The Marquette company's new bid is said to be the same as before with freight charges deducted.

Tennessee Valley Authority asked bids on a cement of its own specification. According to the *Knoxville Journal*, "it is about half-way between low-heat cement and ordinary portland cement," P. J. Freeman, principal materials engineer of the TVA engineering service division, explained in a talk recently to Technical club.

Northwestern States Portland Cement Co., Mason City, Ia., is making plans to reopen in the near future after an extensive program of repairs and overhauling, according to B. A. MacDonald, assistant to the president of the corporation. Shipments are being made to all sections of the company's territory and, although these are light, they indicate a substantial recovery from the conditions of a year ago. The officers of the company, headed by Col. Hanford MacNider, president, are viewing the future with "a restrained optimism." When the plant is re-opened the officers of the company plan to continue operation for the remainder of the year. A state supreme court decision, recently handed down, now permits the Northwestern States Portland Cement Co. to proceed with the reorganization into an Iowa corporation instead of a West Virginia institution.

Slag Association Offices Moved

ON May 1, the National Slag Association offices will be moved from the Leader Bldg., Cleveland, Ohio, to the Earle Bldg., Washington, D. C. Harry J. Love is manager.

To Develop Oklahoma Rock Asphalt Deposit

H. HANENKRATT AND H. D. BARNDOLLAR are planning to develop the rock asphalt deposits of Pontotoc county, Oklahoma, two miles west of Ada. It is proposed to erect a crushing and screening plant of 400 tons daily capacity. The output will have to be trucked to the nearest railway shipping point. Mr. Hanenkratt has been in the highway construction business.

Sand and Gravel

Muskingum Valley Gravel Co., Zanesville, Ohio, has purchased the plant and equipment of the Buckeye Sand and Gravel Co.

Consumers Sand Co., Topeka, Kans., placed in bankruptcy a couple of months ago; W. G. Dickey, a local contractor, has been appointed trustee. It is expected the company will soon be reorganized.

Eugene Sand and Gravel Co., Eugene, Ore., J. R. McKy, owner, is completing a new plant at the east end of Eighth Ave. and the river. A 1700-ft. rail spur has been built to the plant. Capacity is about 50 cu. yd. per hr.

M. N. Hawkins, sand and gravel producer, Marshalltown, Iowa, has a unique and valuable by-product—giant walnut and oak logs, which have been under water and under gravel in his pit probably since prehistoric times. He sells them to a neighbor who cuts them up for gun stocks and fine cabinet purposes.

Rockaway Sand and Gravel Co., Mineola, N. Y.: Public nuisance indictments against the company and its president, Andrew Scurachio, were dismissed by Acting County Judge Gilbert J. Baker, when the court granted a demurrer raised by the defendants. The indictments were found, following a long investigation by the district attorney's office, after two drownings in the stagnant pool at the bottom of a sand pit operated by the defendants. The indictment charged that presence of the sand pit endangered the lives and safety of all persons, especially young children residing in the vicinity. Defense counsel contended that the indictment did not state facts sufficient to constitute a crime and that the issue of a doctrine of attractive nuisance brought forth in the indictment was not recognized by New York State.

Atlanta, Ga.: City has adopted an ordinance requiring sand and gravel dealers to furnish certificates signed by the city inspector of weights and measures in the sale of their material.

Colonial Sand and Stone Co., New York City: Truck drivers were given fines ranging from five to ten dollars each at Huntington, Long Island, for overloaded trucks.

Le Grande Sand and Gravel Co., Rock Rapids, Iowa, A. J. Schneidmeyer, superintendent, has recently completed its new plant; capacity about 250 tons per day.

Crushed Stone

North Carolina State Labor Commissioner, Raleigh, N. C., has announced that his department has just completed an exhaustive study of quarries and has com-

piled a set of "Safety Rules for Quarries" which may be obtained by persons interested in quarrying activities. He said he had consulted some of the leading authorities in the country as to quarrying rules and regulations in other states in compiling the new rules which, under state law, must be observed by all persons operating quarries in North Carolina.

Franklin Limestone Co., Nashville, Tenn., has added a new side-line. It now represents the Barrett Co. as one of the Barrett "Approved Roofers." The *Nashville Tennessean* says: The Barrett policy allows for only two approved roofers to the city. It is significant that the Franklin Limestone Co., for 20 years one of the leading building material supply houses of the state, should be so selected. The reputation of a firm and the integrity of its officers are carefully weighed by Barrett before consideration of the franchise is given. It is also announced by officials of the Franklin Limestone Co. that a completely equipped sheet metal shop has been installed, under the direction of experienced workers in this craft. It is also announced that one of the foremost roofing men of this section has been obtained to head that department. With the organization of these departments, officials say, a full line of shingle and roll roofing has also been stocked. The company is chiefly engaged in producing crushed stone.

Blue Rock, Inc., Washington Court House, Ohio, has doubled its payroll and is making extensive improvements in anticipation of a busy season.

Sturgeon Bay Co., Sturgeon Bay, Wis.: A new loading apparatus for handling quarry run stone is being installed, also two new dinkey locomotives and 25 dump cars. All equipment will be ready for work and quantity production will be undertaken as soon as weather conditions will permit. Throughout the winter much work has been accomplished in getting everything in readiness to handle the large amount of stone required for the breakwater contracts at Indiana Harbor, Ind., and Port Washington, Wis. The work of supplying stone for these contracts will, it is understood, require about two years and during the season of navigation it is believed that upwards of 150 men will be engaged at the quarry. While no statement would be made concerning activities at the present time, it is understood that only such men as have been on relief rolls or were connected with the work at the plant during past seasons would be given employment. In addition to the two contracts already mentioned, it is expected that the company will secure the contract for materials to be furnished on several paving projects in this section of the state, and there is a prospect that building construction will create a demand for still other materials, and the outlook seems favorable for one of the best seasons in recent years.

Kelley Island Lime and Transport Co., Kelleys Island, Ohio, according to local press reports, has gotten off to an early start repairing its quarry implements, in anticipation of an unusually active season. According to G. J. Whelan, president of the company, the firm had a prosperous year in 1933 and a still greater year is expected in 1934. Steam shovels are being moved and repaired and locomotives are being reconditioned. The crusher is also a busy place. Supplies are being brought across the lake, now free of ice. Over half of the married men employed by the company are now at work. Last year only five months of steady work were put in. Superintendent E. W. Fenwick of the island branch is directing the repair work.

Jefferson County, Kentucky, has a crushed-stone quarry which, according to the *Louisville Times*, is a "costly luxury." The newspaper contains an exhaustive article on the operation showing that the attempt to serve distant points from this operation is costing more than stone could be purchased for. The article analyzes the county's alleged cost figures and shows discrepancies. The newspaper states: "At the present time private quarries are operating under a temporary code price of \$1.10 a ton at the quarry. As surprising as it seems, in several random cases where comparative delivered costs were checked, these privately-owned quarries could even now, at this higher price, deliver stone to the county cheaper than the county charged itself in 1933 when costs were much lower.

"For example, a county audit shows that in the fall of 1933 improvements on the Palatka Road, in the central western section, cost \$425.45 for rock and \$734.21 for hauling, arbitrarily based on 70 cents a ton rock production cost and 8 cents a ton mile for hauling.

"The 607 tons of rock required cost \$1.21 a ton to transport, or a total of \$1.91 a ton laid down on the road, by the county's own figures. At this time, when quarries are charging \$1.10 a ton at the plant, the Fiscal Court could have a similar quantity and quality of stone delivered to the same spot for \$1.85 a ton or less. And if the county attempted to duplicate the order from its own plant, it would cost the taxpayers \$2.11 a ton, based on the present approximate cost of 90 cents a ton to produce," concludes the newspaper.

Lime

Clearwater Lime Products Co., Orofino, Idaho, plant is being opened up and improvements made under new ownership and management. J. B. Maxfield, former general manager and vice-president of the Idaho Portland Cement Co., is the new general manager. The new company will be known as the Washington-Idaho Lime Co. According to the local newspaper, the plant as it now stands is to be entirely revamped with all present machinery which fits into the

scheme being used and new machinery and equipment being installed. The company plans to do all work with power equipment, including shovels, in order to be able to operate in large quantities. The company will manufacture lime and lime products, including fertilizer, chicken grits, paper rock, etc. The quality of Orofino lime rock has already been established through operations conducted by former companies which shipped numerous orders.

J. B. May, Guntersville, Ala., is reported to be promoting a lime kiln proposition.

Gypsum

Certain-teed Products Co. is reported to be installing packing equipment for 10-, 15- and 25-lb. sacks at its gypsum plant at Blue Rapids, Kan.

United States Gypsum Co.'s advertising manager, E. M. Oren, recently told members of the Chicago Direct Mail Advertising Club: The advertising department of the company is set up like an advertising agency, prepares copy for all the company's advertising including window displays for dealers, samples, labels, direct mail pieces for the seven major products—gypsum, lime, insulation, asphalt roofing, paint and steel products. "The job of the advertising department is to do the advertising, and the work of the advertising agency handling the account is invariably more efficient if the company's own advertising department forms a good pivot on which agency service swings," said Mr. Oren. The speaker's conviction was that competently manned advertising department has an established point of view which interprets the policies of the company. He said that all members of the advertising department talk a common language and have a like slant on copy and layout. Mr. Oren exhibited several dozen specimens of recent mailing pieces addressed to building material dealers, and cited the returns which some of the more elaborate mailings achieved.

New West Coast Ready Mix Concrete Plant

COLUMBIA CONCRETE CO., West Kelso, Wash., is the name of a new enterprise started by W. H. Sharp, former general manager of the Longview Concrete Pipe Co., Longview, Wash. Bunkers have been arranged for near the Star Sand and Gravel Co.'s plant and on the Cowlitz River.

Mississippi Lime and Material Co., Alton, Ill., is reverting to open quarrying methods after several years' experience with mining limestone. Before going into mining, the company stripped by hydraulic methods. It is now reported the 60 ft. of overburden will be moved by shovels and caterpillar trucks. About 100,000 cu. yd. is involved. Local home owners are rejoicing over the source of lawn and garden soil available.

Sand-Lime Brick Industry's Code Now Effective

NATIONAL RECOVERY Administrator Johnson approved the Code for the Sand-Lime Brick Industry, March 26, and it became effective April 5. Code provides that no employee shall be permitted to work in excess of 40 hours in any one week, nor more than 8 hours in any one day, nor more than 6 days in any one week. Exceptions are provided for employees engaged on emergency maintenance or emergency repair work; such employees when so engaged being allowed to work in excess of the basic maximums provided overtime is paid at the rate of one and one-third the normal rate for all hours worked in excess of 8 per day and 40 per week. Exceptions are provided for employees at plants subject to unfavorable weather conditions, affected employees being permitted to work as much as 48 hours in any one week, but not more than 40 hours per week as averaged over any four week period. A tolerance is granted for foremen, who may work 15% longer hours than the 8 and 40 hour maximums provided. Watchmen are not subject to the basic limitations, but are not permitted to work more than 56 hours in any one week. Tolerance is provided for employees necessary for the closing of hardening cylinders. The code provides for minimum hourly rates of pay of 40c in the North, 35c in southern California, 30c in the intermediate zone, and 25c in the South; this minimum wage provision applying only to common or totally unskilled labor.

Open-price selling is provided for as follows: (a) Each member of the industry shall publish and file with the Code Authority within ten days of the effective date of this Code a price list of all industry products offered for sale or sold by him and all terms, conditions of sale and credit extensions relating thereto. Such price lists and terms and conditions of sale so filed with the Code Authority shall be open to inspection at all reasonable times by any interested party. Revised price lists or revised terms and conditions of sale may be filed from time to time thereafter with the Code Authority by any member of the industry; provided, however, that such revisions shall be filed with the Code Authority five days in advance of the effective date thereof; and provided further, that any other member of the industry may file revisions of his price list or terms and conditions of sale to meet the revisions first filed, which may become effective upon the date when the revised price list or revised terms and conditions of sale first filed shall become effective. (b) No member of the industry shall sell or offer for sale any product of the industry at prices lower than the prices filed in his price list, or on more favorable terms and

conditions of sale, than the terms and conditions of sale previously filed by such member with the Code Authority in accordance with the provisions of Subsection (a) of this Section and in effect at the time of such sale.

Administration is in the hands of a Code Authority of seven members, all of whom shall be the chairmen of their respective seven regional committees.

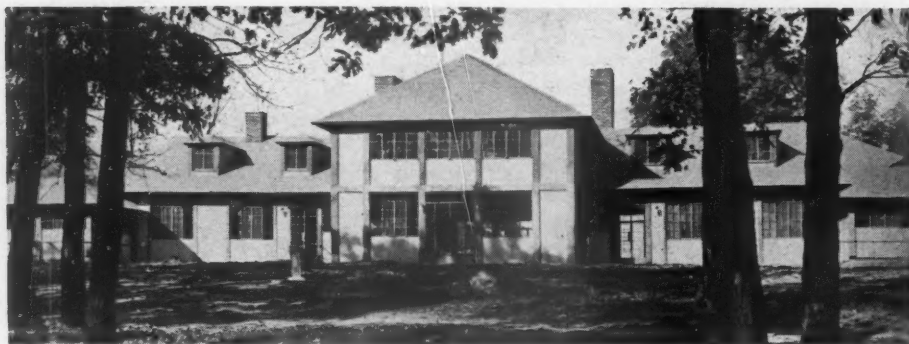
At a meeting of the sand-lime brick industry in Cleveland, Ohio, April 23, under the auspices of the National Sand-Lime Brick Association, the following members of the Code Authority were announced: Region No. 1 (the States of Maine, New Hampshire, Vermont, Massachusetts, Connecticut and Rhode Island, with the exception of that territory included within a radius of seventy-five (75) air-miles of the City Hall of New York City), **C. H. Carmichael, Medfield, Mass.**; Region 2 (the territory included within a radius of seventy-five (75) air-miles of the City Hall in New York City and including all of Long Island), **Harold J. Levine, Long Island City, N. Y.**; Region No. 3 (New York, New Jersey, Pennsylvania, Delaware, Maryland, and the District of Columbia exclusive of the areas covered by Region 2 above), **Thos. H. Lineaweaver, Philadelphia, Penn.**; Region 4 (Virginia, West Virginia, Kentucky, Louisiana and those States south of the Ohio River and East of the Mississippi River), **Geo. E. Dunan, Miami, Fla.**; Region 5 (Texas, Oklahoma, New Mexico, Arizona, California, Nevada, Utah, Washington, Oregon, Montana, Idaho and Wyoming), **J. T. Sheffield, Phoenix, Ariz.**; Region 6 (Missouri, Arkansas, Iowa, Kansas, Colorado, Nebraska, the Dakotas, and that part of Illinois not included in Region 7 below), **J. C. R. Felker, St. Louis, Mo.**; Region 7 (Minnesota, Wisconsin, Michigan, Indiana, Ohio and that part of Illinois included within a radius of fifty (50) air-miles of the City Hall in Chicago), **J. Morley Zander, Saginaw, Mich.**

Daniel Evans Stone Co., Marion, Ohio: An order approving sale of the property of the company for \$35,000 was made by Common Pleas Judge George B. Scofield. The purchasers are the newly-organized Evans Stone Co. and the France Quarries Co. of Toledo. The sale was made by A. J. Berry, receiver for the Daniel Evans Stone Co. The property, appraised at \$56,274, included all property except accounts receivable. The receiver's application to the court for an order approving the sale stated that the sale at \$35,000 permitted the payment in full of all labor claims and 50% to all other creditors.

Cement Products

TRADE MARK REGISTERED WITH U. S. PATENT OFFICE

Modern Concrete Brick Makes Headway In Large Building Projects



Precast concrete joists and lumber as well as concrete brick were used in the clubhouse (left), Prettyslake, Mich. Right: Cement brick in city hall of Kalamazoo, Mich.

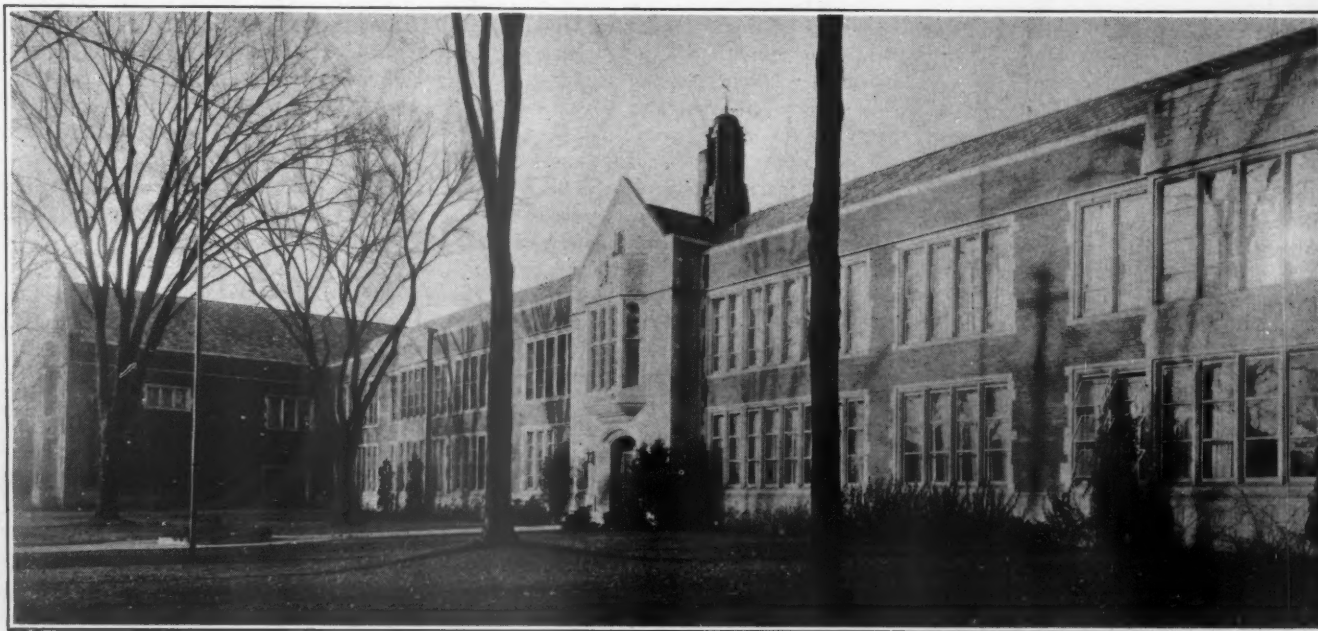
THE plant of the Kalamazoo Haydite Co., Kalamazoo, Mich., is an unusually interesting place to visit. C. Val Berry, its owner, is an interesting individual to meet and talk to because of the things he has accomplished and is doing in the concrete products field. For instance, a 31-ft. cabin cruiser is nothing that you would expect to find in a concrete products plant. Yet there it is—an unusual bit of concrete construction just completed. Complete with sailing rig and auxiliary engine, the neat, trim craft is soon

to be launched in the Kalamazoo River. Its weight is the approximate equivalent of wood construction; and its owners, Young and Adams, are pleased with its qualities of fireproofness, permanence and its many other advantages over wood construction.

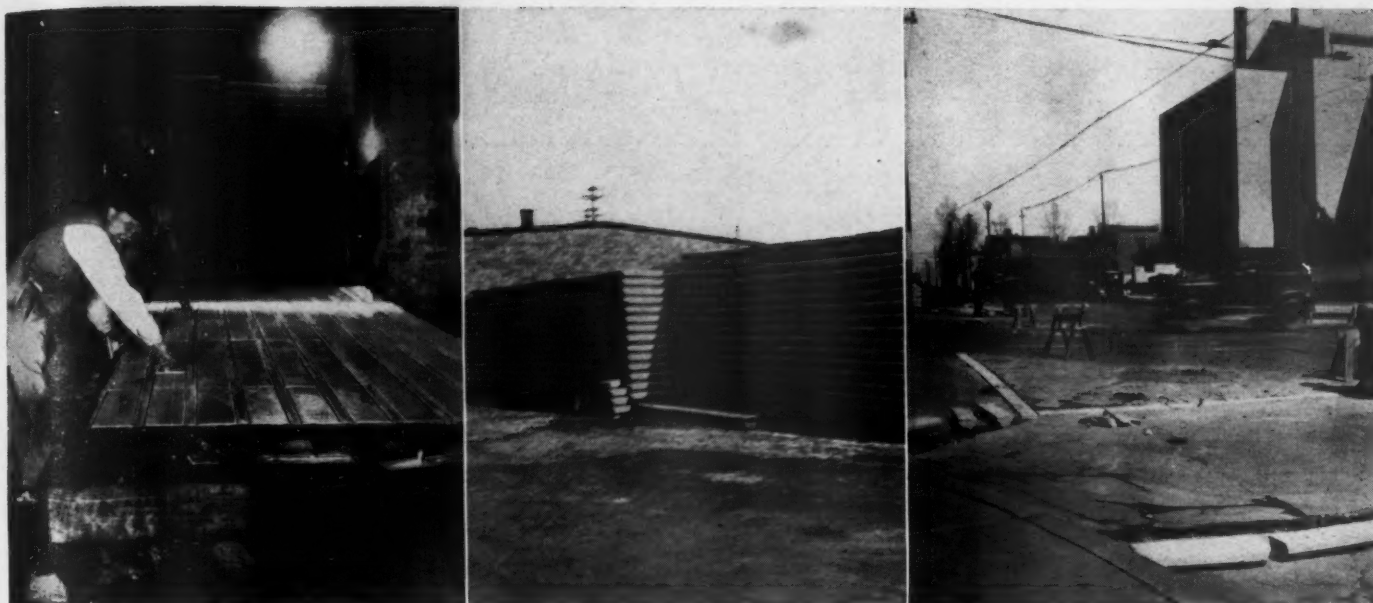
Although the hull of this concrete ship was built several weeks ago, close examination of its 1¼-in. wall reveals nothing in the way of crazing or checking. It will be painted orange below the water line and green above, with gold trim. Some wood

trim will be used on the deck and in the cabins. Mr. Berry, the builder of the concrete ship, looks upon it as an interesting experiment, perhaps something that may hold much in the way of future development.

But he is of the hard-headed aggressive type and has not depended on any such specialty with which to keep his plant operating during the past three years of depression. He has, however, utilized his past experience as a contractor and manufacturer to produce new, yet staple products which



The Ann J. Kellogg school is another outstanding structure in Battle Creek, Mich., built of standard-size concrete brick



Traffic lane marker molds, stock piles and installation

have greatly extended the market normally covered by concrete and were instrumental in successfully carrying his plant through the period of depression. His experience in the building field too was used to good advantage in his contacts with architects and others interested in building projects. As a result, he has succeeded in getting a new and improved type of concrete brick and lumber, which he manufactures in his plant, specified in some of the largest construction work developed during the past few years in his trade territory.

Cement Brick Buildings

Among the substantial projects are the clubhouse of the Prettylake Vacation Camp, Prettylake, Mich., in which the company's concrete lumber, concrete joists, as well as concrete brick were used; the Ann Kellogg School for Crippled Children; the South-eastern (Kellogg) Junior High School and W. K. Kellogg Auditorium and Junior High School, Battle Creek, Mich., and the imposing City Hall at Kalamazoo. The Battle Creek buildings were designed by the nationally known architect, Albert Kahn, of Detroit.

For all of these buildings, the concrete brick offered a successful, two-way competition with the nearest competitive products considered—clay or sand lime brick. At present prices, allowing a fair profit to the producer, the concrete brick can be quoted \$2 a thousand under clay.

This lower cost, says Mr. Berry, is made possible by a new type of straight-line production machine developed during the depression, and by a saving in weight and materials due to the void in the brick.

Another Michigan producer that has promoted the use of concrete brick effectively is the Bayer-Brice Co., Flint, Mich. A million concrete brick recently were made in this concern's plant located near Flint for

Traffic Lane Markers of Precast Concrete

PRECAST TRAFFIC LANE markers offer a market for concrete products manufacturers. Safety zones, pedestrian traffic lanes at street intersections and lines at curves in streets are marked with painted lines in most cities. These require frequent painting.

Precast concrete markers capped with white cement mortar give permanent, maintenance-free lines. They are adaptable for installation in old streets and are less expensive, over a period of years, than painting.

At the present time, Omaha, Neb., is installing 240,000 lineal feet of these markers; the improvement was started as a CWA project. Products manufacturers in other points now have a special opportunity to sell municipalities on this system for marking old streets, and get it adopted as standard for 1934 construction. The timely and unusual sales argument for this concrete specialty is that a considerable amount of labor is required for installation, so such work can well be made a relief project.

Omaha markers are made in blocks 4 by 6 by 24 inches, capped with 3/4-inch white cement mortar. They were set in trenches dug in the pavement surface, and embedded in early strength mortar.

use in the Dailey Brewing Co. plant. The Michigan School for the Deaf, located in Flint, also was built of Bayer-Brice brick units.

Brewery Brick

"We feel proud of the fact that our Dunbrik were used in the construction of the Dailey Brewery," says Theodore Brice, "for

the reason that it has been probably the largest building constructed here during the depression and in all probability the first brewery to be constructed in the United States since the time of prohibition; also because of the fact that it was designed by an outside architect, George J. Fuchs, of Detroit, who was well pleased with the brick."

Brick Test Data

"We submitted samples to the Flint building inspector, Otto Phillips, during the winter and the tests showed very satisfactory results. Crushing strength of the brick ran to 2,800 lb. with a new brand of cement with which we have been experimenting. Incidentally, we are making a brick now which is very white, in fact about the color of sand lime brick."

Until recently, Michigan State Highway specifications included only allowance for clay brick on projects where manhole and catch basin brick units were needed. Now, through the efforts of Theodore Brice, the way is opened for concrete brick in this field. "To make a long story short," relates Mr. Brice, "I have taken this matter up with the Federal Highway Department at Washington, the district at Chicago, the resident engineer in Detroit, and with the Portland Cement Association whose representative got in touch with the Federal Highway Engineer in Chicago who is in charge of this district. As a result of these efforts, I have received a letter from the State Highway Department stating that the state specifications were being changed to include cement brick so that they could be used on future work."

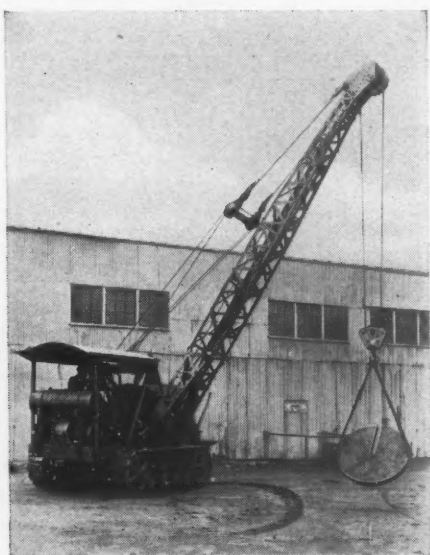
Summing up the experience of Bayer & Brice, the Kalamazoo Haydite Co., and similar plants located in other cities—their success in getting the new unit into the various fields—and the standing of the architects who have used it in high-grade construction—all brick is creating a market well worth while.

New Machinery and Equipment

Lifting Tests With Utility Crane Reported

THE WIDE RANGE of uses to which the Harnischfeger "Hustler" crane may be put to, include handling of material and equipment, such as heavy pipe, etc. The company stresses the fact that the unit is convertible for clamshell crane, dragline scraper, pile driver or tractor service.

This crane, designed primarily for speedier load handling, has two side drums and a



Convertible general utility crane

front drum, each being independent; each drum has three forward speeds and one reverse. In lifting tests with counterweight, the machine carried 12,000 lb. at a distance of 6 ft. Without counterweight, it picked up 5200 lbs. from the edge of the tread and travelled with it at the rate of 5.2 mi. per hour. With detachable stiff-leg under the boom, says the manufacturer, the machine will lift 35,000 lb.

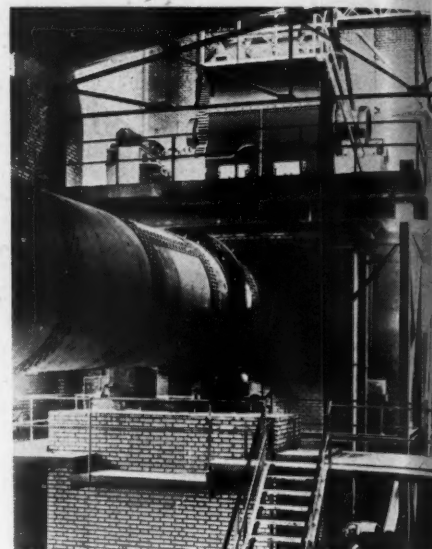
Sectional view of slurry dryer and preheater showing rotating drum, cylindrical grate, fan, outlet, etc.

Slurry Dryer and Preheater for Cement-Kiln Feed

B RADLEY PULVERIZER CO., Allentown, Penn., sole agents for the United States, Canada and Mexico for Miag Braunschweig, Germany, announces a new piece of cement-mill equipment designed to prevent some of the enormous heat loss in the ordinary kiln installation and to increase the output and efficiency of kilns, particularly in the wet process. The device is known as the Miag "Calcinator," and a number of installations have been made abroad, including one at the plant of the Alpha Cement Co., Ltd., Rodmell, England, of which Albert Y. Gowen, former vice-president of the Lehigh Portland Cement Co., is managing director.

The "Calcinator" is a slowly rotating drum 10 to 13 ft. diameter by 5 to 10 ft. long, depending on capacity desired. The shell is built up of bars 2 to 3 in. apart, forming a cylindrical grate. The raw material (dry process feed may be used) or slurry is fed through this grating from ports in the upper right-hand quadrant. Hot gases from the kiln enter through the discharge port in the lower right-hand quadrant, and leave through a suction outlet opposite in the upper left-hand quadrant.

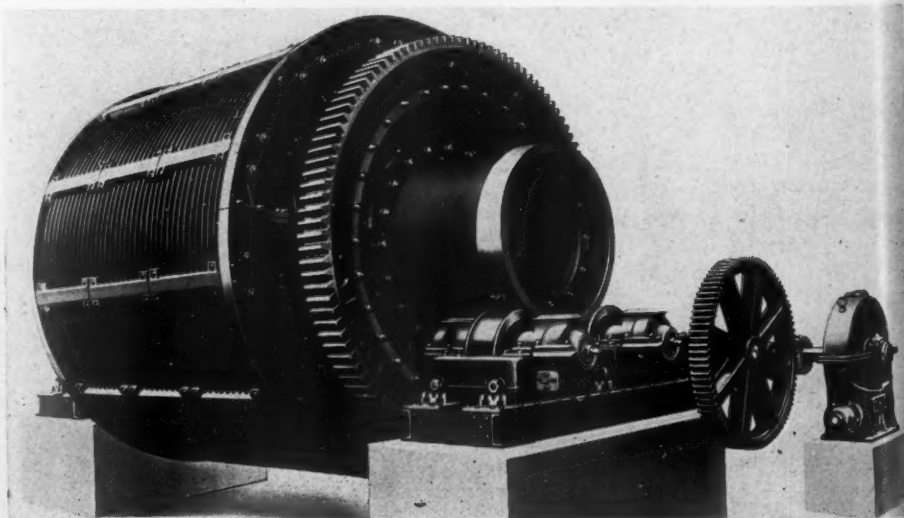
To keep the material from dropping straight through the grate, and to provide a heat-transfer medium the cylindrical grate is about half full of what the manufacturer describes as "filling bodies," which are too large to pass through the slots in the grate. The rotating grate drum is of course enclosed in a steel housing. An induced draft or suction fan, 1 to 3 in. water column draft, is placed between the gas outlet and the dust column of the kiln stack.



Typical installation of dryer-preheater, showing small head room required

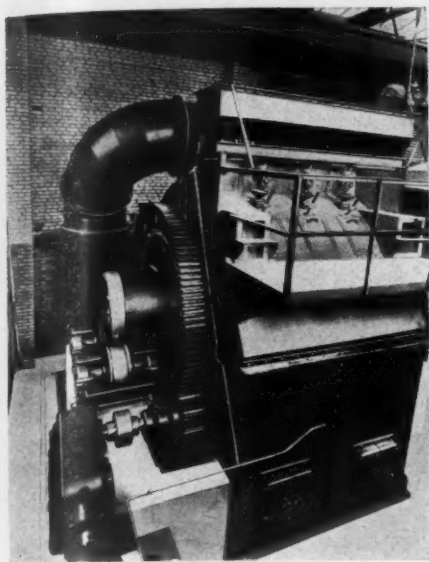
The Calcinator is designed to be added to present kiln installations with little change in the regular layout. The slurry is pumped in the usual way to a small compensator tank, which is a part of the Calcinator installation. From this tank the slurry feeds through several nozzles into the Calcinator. On account of the continuous rotation of the cylindrical grate with its load of "filling bodies," the slurry is quickly distributed and passes down through the channels between the heated "filling bodies." The temperature of the kiln gases are said to be reduced to 195 to 230 deg. F. in their passage through the Calcinator.

The kiln feed is claimed to be discharged from the Calcinator as "dry, preheated



View of drying and preheating device for slurry, with outside shell removed showing grate bar

granules"; and the capacity of the kiln is much increased because the exit gases from the kiln are 400 to 500 deg. F. higher in



View of device showing slurry feed

temperature than they would be if the kiln had been fed with normal wet slurry; in other words, there is that much more heat available in the Calcinator for drying and preheating the slurry. Stated in another way, for the same kiln output considerably less fuel is required.

The device is claimed to be effective with any ordinary length of kiln, and, it is said, may be used to increase the efficiency of a dry-process kiln. In this case the dry mix is moistened as it enters the Calcinator to facilitate the formation of the granules, which are a distinctive feature with this device. It may also be applied to shaft kilns.

Drifter Drill Competition

ANNOUNCED after completion of an unusual drilling contest in which 53 two-man teams competed, the new "D-89 Selffeed" drifter is described by engineers of the Gardner-Denver Co., Quincy, Ill. This type of drifter is said to embody a self feeding principle not used before in rock drilling units. The company claims that the new unit is vibrationless, with a rate of feed allowed



Self-rotating drill

for which is in relation to the high speed with which the D-89 bites into rock.

The contest in rock drilling was held in Indio, Calif. Each team was required to set up, connect hoses, drill 5½ feet of 2½ inch bore hole in stiff rock—and then tear down. The fastest drilling time recorded on the 5½

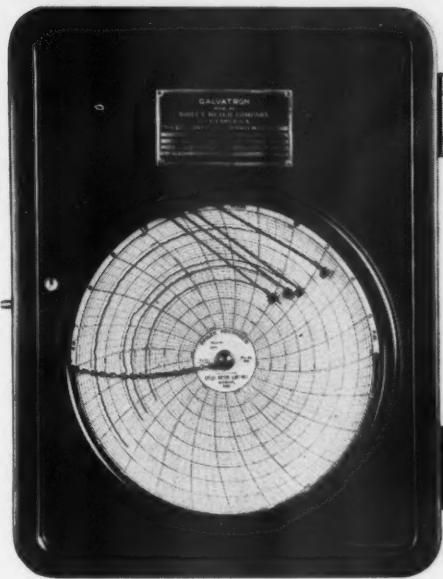
Truck-mounted shovel with improved control device



ft. hole was 3½ minutes. This record was made with a D-89.

Pyrometer

ONE OF THE "Galvatron" units introduced by the Bailey Meter Co., Cleveland, Ohio, may include as many as four potential meter circuits—the contact making



Recording pyrometer

unit being automatically switched from one circuit to the next by relays. The relays are actuated from contacts made by a synchronous motor driven timing device. "An outstanding feature of this pyrometer," explains the company, is its continuous series of records, up to four in number, made on a circular recording chart.

Mobile Shovel Unit

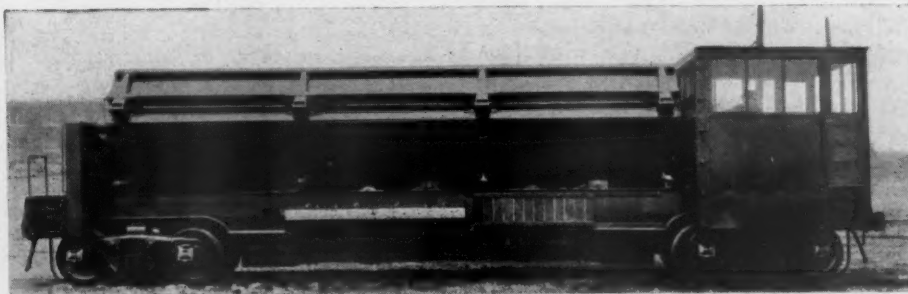
WHEREVER and whenever gravel pit and stone quarry operators have short jobs at widely scattered points, the Michigan truck shovel has been designed to provide a safe, economical and efficient means of accomplishing them. On a typical, small local operation, Matt Thar, Hartford, Mich., has been using this equipment with good results. It is easily moved to and from the various locations developed by the Thars, and, according to the operator, stands up against the punishment of hard and steady work.

This truck shovel (interchangeable with crane unit) can be safely transported, says the Michigan Power Shovel Co., Benton Harbor, under its own power at a speed up to 20 miles an hour. Either a 50 or 60 hp. engine is supplied, depending on requirements of the purchaser, and this furnishes the digging as well as motive power.

"Finger-tip" control is cited as the outstanding feature of this truck shovel. Says the manufacturer: "There are no heavy, cumbersome clutch levers to fatigue the operator. Its control is accomplished through use of pneumatic clutches operated by trouble-free, balanced air valves. The Michigan Power Shovel Co. also manufactures tractor-mounted shovels with the usual alternate equipment.

Quarry Locomotive

A NEW LOCOMOTIVE for quarries, mines, steel mills and industrial plants is now being manufactured by the Differential Steel Car Co., Findlay, Ohio. The unit consists of an internal combustion power plant mounted in an underframe capable of



Locomotive in dumping position

carrying an automatic dump body. The company rates this locomotive unit at 36 tons when light and 76 tons when loaded. It is claimed that the unit can haul a string of cars at the same time that it carries its own pay load. An engineer of the company, describing the locomotive, says, "The dump body of the new locomotive has a level load capacity of 24 cu. yd. and a normal crown capacity of about 40 cu. yd. It is made entirely of steel and is heavily reinforced. Electric arc welding is employed in the fabrication of both the body and the frame to obtain greater strength and reduced weight. Heavy mineral coated electrodes are used throughout for all welding applications."

New Variable Speed Transmission Units

A NOVEL SELF ADJUSTING, variable speed transmission for fractional horsepower duty has been announced by Link-Belt Co. A new unit known as the VRD (variable roller drive) has been



Horizontal type of variable drive

brought out as a companion to this concern's PIV units. The VRD, says Link-Belt Co., is capable of one-half horsepower at maximum speed with a maximum ratio of speed variation of 10 to 1.

Among features named by the company are all metal construction, total inclosure, oil bath, positive chain power. It is the side



Section of side contact roller chain

contact roller chain, connected by hardened steel points in hardened steel bushings that is the novel feature of this new transmission unit. Openings in each pitch of links provide a pocket of each of two hard steel rollers and from both sides a portion of roller protrudes to permit each pair of chain rollers at each engagement to roll into contact with the hardened steel conical discs forming the drive. Finally the chain is engaged positively in the wedge-shaped wheels at the proper pitch line for the speed desired on the output shaft.

New Rod Prices

PRICES ON Amsco nickel-manganese steel welding rod have been revised effective April 1 and schedules are being mailed to purchasers by American Manganese Steel Co. Sample rods and price lists now are available from the company or company representatives in Illinois, Missouri, Colorado, California, Ohio, Pennsylvania, Tennessee and Texas.

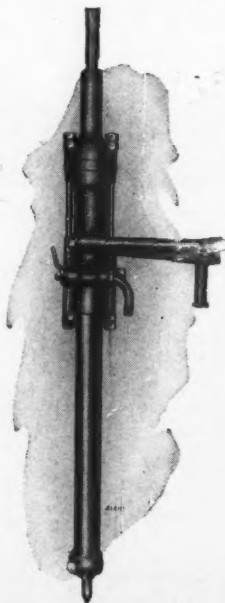
Welding Fittings

AMONG recent advances in welding fittings have been those offered by the Bonney Forge and Tool works, designed to overcome inherent disadvantages of welded pipe-to-pipe branch connections.

Following introduction of welding elbows and welding flanges Bonney "Weldolets" and "Thredolets" were placed on the market. When these are used the inside of the joint is in full view to the operator, thus removing the possibility of "icicles" being formed or scale and welding metal being deposited within the main pipe.

Hard Rock Drill

THE FULL AIR CUSHIONING of the piston in Ingersoll-Rand's new Stope-hamer drill is said by the manufacturer to eliminate the need for springs, thus eliminating movement of joining surfaces. This model unit is supplied with air pressure to keep cuttings out of the front head. The



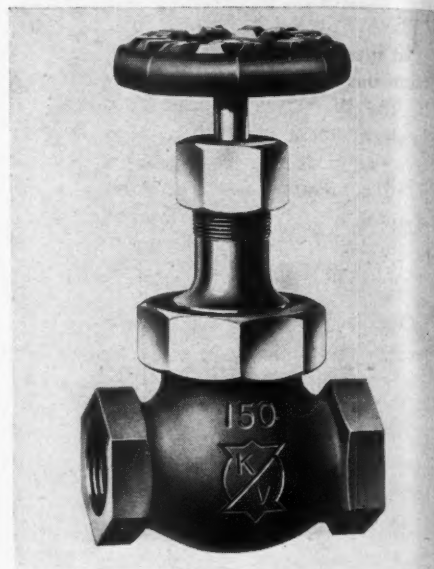
For hard rock drilling

extra long renewable bearing was specified by the designer to assure longer life to anvil block and the cylinder front washer; this feature also is said to maintain the anvil block in proper alignment at all times. High drilling speed, says the company, is obtained

by using the flapper valve which is "light, sensitive, positive in action and protected from injury."

Heavy Duty Valves

THE STANDARD bronze globe and angle valves now offered by the Kennedy Valve Manufacturing Co. have been designed particularly for heavy industrial service. To increase durability, one of the



Bronze valve

new features introduced is cadmium plating of the malleable iron union bonnet ring and stuffing box nut. The company selected this plating as a result of competitive tests for weathering and anti-rusting qualities.

A feature of these valves, according to the company, is the stem head which has a rounded, machined bottom surface to make a low friction contact with the smooth-milled recess in the disc holder. This construction, it is believed, not only reduces friction but also makes it easier to start the valve and then to close it tightly.

One-Way Clutch

A ONE WAY clutch, free wheeling in one direction but driving in the other, the Morse-Kelpo clutch unit is designed to operate with "no back-lash." "It is ideal as a ratchet drive," says the manufacturer. Used to connect two prime movers to a common load, either will pull the load but neither can drive the other. This dual drive finds frequent application for two motors or motor and turbine, for auxiliary stand-by drives or for booster drives in the starting of heavy machines. The unit is made by the Morse Chain Co., Division of Borg-Warner Corp.

Chain Hoists

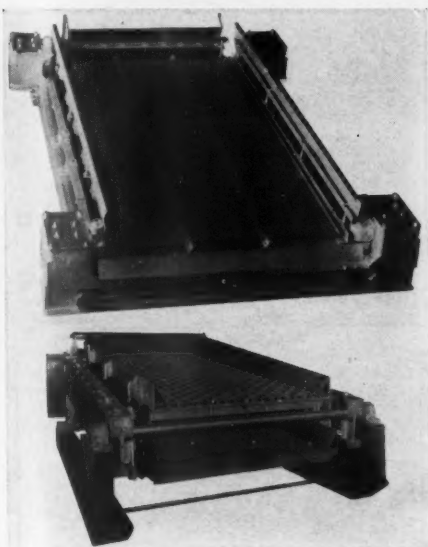
ANNOUNCEMENT of an improved chain hoist is made by the Wright Manufacturing Division of the American Chain Co., Inc., York, Penn. One innovation in this unit is zinc coating of all exposed parts,

thus making the hoist practical for all outdoor operators. Addition of ball bearings with integral grease seals supporting all moving parts, according to the designers, increases the hoist efficiency by 10 percent over that of former models. Continuous lubrication, hardened pawl tip and improved load chain, guard and ball spring covers on oil tubes are given as further features.

Vibrating Screens

TWO NEW SCREENS, which complete a line of screens for all types of material, from the finest to the coarsest, are announced by the W. S. Tyler Co., Cleveland, Ohio. Each of these screens was featured, with full size models on display, at the Joint Exposition, recently held in Detroit. These screens are radical departures from the "Hum-mer" screens which the company also makes, and are entirely different from each other.

The Type 400 screen is novel in that it employs four vibrators, one at each corner. Cross armature beams between top vibrators and between bottom vibrators transmit vibration to the screen cloth stretching and supporting structure, which is said to give intensely active vibration over the entire screen area. No lubrication is required, there



Screen Units

are no pulleys, bearings, eccentrics, shafting, gears, belts or cams. A simple means is provided for changing screen cloth. Screen cloth supports are rubber covered. High capacity and extreme accuracy are claimed.

The "Ty-rock" screen is for handling coarse material, and will operate at as low as 4 deg. inclination. Dual mechanical action produces a whirlpool churning effect at the upper or feed end of the screen. In the lower part of the screen the motion changes to a straight line sorting action. This dual mechanism can be changed to suit varying conditions of feed rate, moisture content and proportion of oversize to fines. Motor drive is incorporated in the design of the machine.

Electrical Control

FOR USE IN connection with remote control of automatic motor starters, Electric Controller and Manufacturing Co. announces a new vapor-proof and dust-tight "safety lockout" push button.

This unit is for installations where it is desirable to start and stop a motor through its magnetically-operated starter or controller from two or more control stations. At any one of the stations, through the use of this device, the push button may be locked in the off position.

Disc Clutches

A MODERN TREND towards standardization and simplification of all mechanical units is reflected in the action of the Twin Disc Clutch Co., which now has com-



Sectional view of clutch

bined what it believed to be the best features of several models into a single series of Twin Disc clutches. Eight sizes are in the series. To complete the line, the company is developing suitable driving spiders for use with all sizes and either one, two or three plates.

Toggle Action

All clutches are of the toggle action type and in addition, the gear tooth driving plates have inner plates that make their drive from the hub in the same manner.

New Tire Reduces Blow-Out Hazard

A NEW automobile tire incorporating a construction change which is said to protect against blow-outs is announced by the B. F. Goodrich Co., Akron, Ohio.

The major improvement is a ply made of a special compound which resists internal heat and friction, according to Goodrich engineers.

"This new tire, tested for hours at high speeds, was found to give three times the blow-out protection to be had in standard

tires without the safety ply," S. B. Robertson, Goodrich vice-president advises.

"We are convinced this latest product innovation reduces the hazard of blow-outs to the absolute minimum," the Goodrich official says.

Remote Control for Welding

SAVINGS UP TO \$500 a year per welder, high quality welding and increased weld output: This is the triple advantage claimed for a new remote control device for welding



Welder control

announced by the Lincoln Electric Co., Cleveland, Ohio. No additional cables, says the company, or other apparatus need be carried by the operator.

He simply taps the electrode on the work several times and the voltage is automatically raised. With this device it is said that the operator can work at any distance from the machine and still regulate the current accurately.

Small Engine Introduced

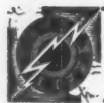
IN ANNOUNCING its "ZX" series of engines the Hercules Motors Corp., Canton, Ohio, has added two units to its line, thus giving a complete range of sizes to its customers from 4 to 200 horsepower. The two new models are identical in design and both are for general application in the small industrial engine field.

Anti-Silicosis Equipment

A LINE OF NEW respirators for protecting workers against the inhaling of silica lead and similar dusts is announced by the Pulmosan Safety Equipment Corp., Brooklyn, N. Y.

Dust control engineers, said the company, cooperated in developing the features of the new respirators. These features are increased filter size, direct breathing intake and coarser wire screens to permit easier breathing. Screens are bound with aluminum, and a gas mask type of exhaust valve is used.

One of the refinements is an all rubber head band adjustable to permit longer wear. The new construction prevents obstruction of the worker's vision.



THE INDUSTRY

New Incorporations

Colonial Concrete Co., Inc., Newark, N. J., concrete products, 300 shares no par.

Basking Ridge Cement Products Co., Morristown, N. J., cement products, \$50,000.

Port Deposit Quarries Co., Inc., Port Deposit, Md., chartered; George Edw. Cantrell and Isaac Doughten, Jr.

Cin Pike Gravel Co., Dayton, Ohio, 300 shares no par. Hanna W. Young, Ruey F. and Dale Hodapp are the incorporators.

Meriwether Gravel Co., Inc., has secured charter with James S. Meriwether and Ned A. Stewart.

National Rock Asphalt Corp., Wilmington, Del., \$150,000.

Transit Mix Concrete Co. of Texas, Houston, Texas. Capital stock \$30,000. Incorporators are: L. D., Mrs. Abbie and Videll McKaughan.

Atlas Sand and Gravel Co., Janesville, Wis. 150 shares common stock at \$100 each. To engage in sand and gravel business, with F. C., F. A. and E. C. Schultz as incorporators.

Prince George's Sand and Gravel Co., Inc., Upper Marlboro, Md., chartered; Chester Pyles, John C. L. Ritter, Jr., Washington, D. C.

Tempe Sand and Gravel Co., Tempe, Ariz., has filed articles of incorporation with a capital stock of \$50,000 and is incorporated by R. J. Hight, Carl H. Spain and F. L. Parry.

Victoria Gravel Co., Houston, Tex. To engage in sand and gravel business with a capital stock of \$50,000. George R. Brown, Edgar Monteith and A. W. Baring are the incorporators.

St. Clair Stone Co., Inc., Lafayette, Ind., capital stock, 1,000 shares no par value. To quarry or mine stone, sand and gravel. Incorporators are: Samuel F. Phillips, Maurice A. Neville, Howard A. Swallow, Oswald K. Yeager and Robert R. Bookwalter.

Worcester Trap Rock Co., Worcester, Mass., \$15,000; 150 shares \$100 each and 500 class A pfd. shares no par value. The incorporators are: Ralph M. Davis, Old Towne, Me., president and treasurer, and Herbert Gray and William G. Curran.

Portable Gravel Co., Inc., Lansing, Mich., capitalized for \$25,000 to engage in furnishing gravel for highway work which they already have contracts for. R. G. Bogue is president, C. F. Harper, treasurer, and L. W. Wright, secretary.

Construction Aggregates Co., 33 North La Salle St., Chicago, Ill. 100 shares common. Incorporators: Ezra Sensibar, John M. Balk and Leo Wolfson. To manufacture, acquire, produce, buy, sell or dispose of at wholesale or retail, sand, gravel and building materials.

Associated Enterprises, Inc., Baltimore, Md., concrete products. Incorporators are: Jackson W. Wisner, Allen Marcus and Samuel Klein. Authorized capital stock, 400 shares pfd., \$50 par value and 400 shares common, no par value.

Michigan Gravel Co., Saginaw, Mich., has filed articles of incorporation. J. R. Sensibar and Raymond W. Dull of Chicago, Ezra Sensibar, Alpena, and Fred Wilcox of Greenbush and Olive Owens of Saginaw, Mich., are the incorporators. Capitalization, 1,000 shares of common stock to be sold at \$25 a share.

Personals

Albert C. Dale recently was named head of the Ohio Concrete Producers Association at a meeting in Columbus, Ohio.

Robert A. Young, Allentown, Penn., has been elected a director of Lehigh Portland Cement Co. to succeed the late General Harry C. Trexler.

H. J. McDargh has been appointed district engineer for the Indianapolis, Ind., office of the Portland Cement Association. Four field engineers will assist Mr. McDargh in his work in Indiana.

Oscar Davis, superintendent of the Lehigh Portland Cement Co. plant, Mason City, Ia., has resigned. Superintendent Davis has held the position since 1910 when the plant began operation.

Colonel D. D. Thompson, president of the Kentucky Rock Asphalt Co., Louisville, Ky., recently was scheduled as principal speaker before the Highway 31-W association meeting at Elizabethtown.

Charles Boettcher, president of the Ideal Cement Co., Denver, Colo., observed his 82nd anniversary, April 7. Interviewed, he said, "I like to work hard as it is a stimulant. No one hurts himself by work. It is worry that harms."

W. D. Sankey, Jr., formerly of Montgomery, Ala., has been appointed assistant sales manager of the Lone Star Cement Co. in Birmingham. His connection for the past seven years with this concern has been that of traffic manager.

W. H. Andrew, consulting chemist and research engineer for the Allentown Portland Cement Co., Allentown, Penn., recently addressed the "Cement Night" meeting of the Lehigh Valley at the Bethlehem club.

H. B. Biehn, formerly of Kenton, Ohio, has been elected president and general manager of the Blue Rock, Inc., quarries at Washington.

M. M. Smith, formerly of Syracuse, Ind., has arrived in Guayaquil, Ecuador, South America, to take over the management of La Cemento Nacional, C. A. The cement plant of this company was put into operation about ten years ago. Before leaving the states Mr. Smith purchased additional equipment to supplement the Krupp machines with which the plant was originally furnished. The plant is dry-process with a rotary kiln approximately 6½ ft. in diameter by 100 ft. long. Hard limestone and clay are the raw materials.

Cement

Consolidated Cement Corp. plant at Fredonia, Kan., recently resumed operation.

Dewey Portland Cement Co., Bartlesville, Okla., made a 10 percent wage increase effective during April.

After being closed several months the Monarch Cement Co. plant, Humboldt, Kan., began operation recently.

Monolith Portland Midwest Co. cement plant south of Laramie, Wyo., recently resumed operations on full schedule.

Colorado Portland Cement Co. plant, Portland, Colo., recently recalled 100 workers to resume production.

Lone Star Cement Co. plant Limerdale, Ind., resumed operations April 2 after a three-month shutdown.

Federal Portland Cement Co., Buffalo, N. Y., reopened one unit of its Hamburg Turnpike plant April 2.

Universal Atlas Cement Co. has announced a 10 percent pay increase for workers retroactive from April 1, 1934.

The Chanute, Kan., plant of the Ash Grove Lime and Portland Cement Co. resumed operation in April.

Alpha Portland Cement Co. plant, Jamesville, N. Y., was reopened in April after having been shut down since November 17, 1933.

Superior Portland Cement, Inc., started full operation in its plant at Concrete, Wash., recently and anticipates a regular run of from five to six months.

Glens Falls Portland Cement Co. plant, Glens Falls, N. Y., was put into operation April 9. Last year the plant reopened June 15.

Medusa Portland Cement Co. opened its plants at Toledo, Ohio, and York, Penn., during April. More than 200 workmen were recalled at the company's plant in Dixon, Ill., the first week in April.

Sand and Gravel

Hugo Sand Co., north of Kent, Ohio, recently has run at full capacity on highway orders.

C and B Gravel Co., near Lebanon, Neb., for about a year, has moved its equipment to Cambridge, Neb.

T. McDonald, Clinton, Mo., has been appointed to act as a receiver for Standard Sand and Gravel Co.

Arkansas City Sand and Gravel Co., Arkansas City, Kan., has installed gravel washing equipment in its plant.

W. C. Hill, Rickreall, Ore., has built new gravel bunkers on rock and gravel plant property recently acquired at Independence, Ore.

Holloway Gravel Co., Amite, La., reports property loss as a result of lightning striking its pump house. The loss is estimated around \$1500.

Meriwether Sand and Gravel Co., Lewisville, Ark., has reopened its plant and anticipates a run of about six months on the basis of orders now in sight.

Adolph Denbrook, Ripon, Wis., has opened new gravel pit and added new units to his equipment, including an excavator, automatic sand screener and truck.

Tulsa Sand Co., Tulsa, Okla., has made an average shipment of 17 cars of sand weekly since the first of the year, according to T. M. Moxley, superintendent of the plant in Kaw City, Okla.

After disposing of his interest in the Zenith Gravel Co., some months ago, H. H. Kelly, Carlton, Minn., again has taken over active management of the property. It is now open for operation.

Approximately 100 carloads of sand and gravel have been shipped from Janesville, Wis., weekly, during the past month over a single railroad, according to figures released the first week in April.

The City of Alturas, Calif., has purchased a gravel pit from the Round-up Association. The stipulation was made that the purchase price was not to exceed the amount due on city taxes from the association.

Authority was given the first week in April in common pleas court at Hamilton, Ohio, to Robert A. Gibbs, receiver, to accept an offer of \$8,000 from E. B. Moorman and A. J. Moorman for the assets of the Columbia Sand and Gravel Co., Middletown, Ohio.

Spring activities of the Missouri River Sand and Gravel Co. got under way at Boonville, Mo., recently. A new barge has been built and repairs made on the "Dixie." Another boat is being used to move equipment for the first sand dredging operation of the year.

Mirabel Gravel Co. plant near Santa Rosa, Calif., has been enlarged and equipment added at a cost of \$5,000 to double the capacity of the plant. The storage capacity now is 2500 tons. New screens have been installed and bunkers and loading cars erected.

Test runs recently were made at the Le Grande Company's gravel washing plant south of Rock Rapids, Ia. As a result of the tests, Superintendent A. J. Schneidermeyer, anticipated a normal capacity of about 250 lb. of gravel a day. E. H. Lowderdaugh, Des Moines, Ia., head of the company recently inspected the plant operation near Rock Rapids.

The sand dredging fleet of the Pittsburgh Plate Glass Co., Pittsburgh, Penn., resumed operations the second week in April. Units employed comprise a dredge steamer and 12 barges and scows on the Allegheny river. A special high grade sand is used for the company's abrasive in grinding operations. Production of sand for the following eight months during which the river is open is expected to approximate 150,000 tons.

Quarries

The City of Carrollton, Mo., recently purchased rock crushing equipment.

Staunton Tie and Lumber Co., Jerseyville, Ill., has purchased a quarry site south of Feldon.

Bluffton Stone Co., plant, Bluffton, Ohio, resumed operations for the summer the second week in April.

General Construction Co. has opened a quarry at Mats Mats Bay near Port Townsend, Wash.

Arnold Stone Co. has appointed Charles Bollinger, superintendent of its operations at Neelys Landing.

Shirley Construction Co., Omaha, Neb., has moved quarry equipment to property near Louisville, Neb.

Quarry of the Columbia Contract Co. which has been operated intermittently during winter months is now running at capacity at St. Helens, Ore.

The port commission at Bellingham, Wash., has abandoned its operation at Lummi Island and has removed equipment to new quarry property leased at Pleasant Bay.

Ave., Los Angeles, Calif., in the graft of a special ordinance recently submitted.

More than 14,000 cu. yd. of crushed rock for surfacing and resurfacing county roads has been produced by CWA labor at the Rockton and LeGrand quarries, according to County Engineer D. C. Elder of Marshalltown, Ia.

The Cedar County Board of Supervisors meeting recently at Tipton, Ia., agreed upon three eight-hour days a week and a rate of 25c an hour as terms upon which ex-CWA workers would be continued and work in six quarries and one gravel pit.

Anticipating increased limestone demands, the Allegheny River Limestone Co., Templeton, Penn., announced plans in April for increasing loading and unloading facilities.

A quarry has been opened at Williamsport, south of Astoria, Ore. It is now supplying rock for the Kelso dike.

Through a cooperative arrangement, the City of Raymond and Indiana Road Dist. No. 3 has begun operation of quarry equipment. Labor and operative expense will be taken care of by the city in exchange for half of the crushed rock produced at the plant. The road district has installed an 80 hp. Diesel engine to operate the machinery.

Three stone quarries located in Pleasant Ridge, Belfast and Sandusky, Ia., with inauguration of CWA program have been closed but the quarries will be kept by the county for emergency work in the future. County-Federal projects in Nemaha County, Kan., will go on according to decision of local officials there. Two rock quarries are being continued as relief projects.

Lime

St. John Lime Co., Brockville, New Brunswick, has placed a new kiln in operation.

Riverton Lime Co., Riverton, Va., has recalled about 100 workmen after a shutdown of several weeks.

State lime plant, Okalona, Miss., was destroyed by fire February 1. The \$10,000 loss is covered by insurance.

Chester Valley Lime and Products Co., West Chester, Penn., has had F. S. Wood and E. R. Scott appointed as receivers, effective June 19.

Oregon Lime Products Co., Grants Pass, Ore., has been organized to take over the Oregon Lime Stone Products corporation of Ohio. The company's quarries are in the Williams Creek district.

Miscellaneous

Huffy Asphalt Co. has reopened its pits near Liberal, Mo.

Montbestos Mining Co. recently held its annual meeting at Idaho Falls, Idaho, and reelected its officers.

Northwest Magnesite Co., Chewelah, Wash., reports a high production record unequalled since 1929 with 118 men in the quarry and 82 in the plant.

The State lime grinding plant at Sandy Level, Va., closed for several months, resumed operations April 2.

Granite Materials Co. is granted permission to construct and maintain a rock crushing and sand screening plant in Tujunga.

M. E. Tilton, Chewelah, Wash., has been named superintendent of the Northwest Magnesite plant to succeed C. L. Clyde, resigned.

Rock Asphalt Products Co., Liberal, Mo., formerly known as the Huffy Rock Asphalt Co. has made preparation for the new season's run.

Idaho Phosphate Mining Co., has ordered machinery for its operation at Boise, Ida., for development of the phosphate field which lies in the southeastern corner of the state.

Virginia Glass Sand Corp., Gore, Va., announces employment of 25 extra men to take care of increased shipments. Between 50 and 75 cars of glass sand are being shipped each month to glass blowers in West Virginia, Pennsylvania, Maryland, New Jersey, New York and Wisconsin.

Rapidan Soapstone Corp. has leased 240 acres and some other miscellaneous property to the Virginia Mining and Management Co., Richmond, Va., for the purpose of working soapstone deposits located in this area. Virginia Mining and Management Co. now is operating a similar project in Nelson county where about 500 men are employed. The Schuyler quarries have been operating for 50 years.

Cement Products

Alfonso Cement Block Co. plant, Peabody, Mass., recently was destroyed by fire.

National Cement Products Co., Toledo, Ohio, reports damage to its plant by fire recently.

Cement Products Co., Birmingham, Ala., has begun a radio advertising campaign over station WAPI.

Concrete masonry bearing walls are being used in the one-story barn, 24 ft. by 32 ft., for A. J. Arbach, Englishtown, N. J.

Geneva Brick Products Co., Geneva, N. Y., has furnished 4,000 cinder block units for the new Bradburn Brothers Building in Canandaigua, N. Y.

Weymouth-Crowell Co., Los Angeles, Calif., is building houses in Glendale, Calif., by its new system involving combination of concrete building units and concrete frame.

M. R. Nelson, McAllen, Tex., contractor, is building a concrete masonry mortuary for the Martin-Nelson Funeral Home Co., Weslaco, Tex., requiring 2,079 5x8x12-in. units.

Concrete masonry recently has been specified on contracts awarded at the following points: Buffalo, Bridgeville, Peekskill, Riverhead, Rochester, Syracuse and East Springfield, N. Y., Bridgeport and Greenwich, Conn., Keyport, N. J., and Providence, R. I.

Everett Concrete Product Co., Everett, Wash., is observing its twentieth anniversary. In 1914 it was founded by R. M. Westover, C. M. Robins and the late Harry Shaw. Hans Mumm, Jr., is present manager. The concern makes a full line of products including culvert pipe, drain tile, block, cast stone and garden furniture.

W. H. Sharp, Longview, Wash., formerly connected with the Longview Concrete Pipe Co., has started the Columbia Concrete Pipe Co. The latter concern is said to have taken over the output of the Star Sand and Gravel Co., near Mt. Coffin. The new company's line includes transit-mixed concrete, sewer and culvert pipe, septic tanks, well curbing, tile, etc.

"Raylite" is a new lightweight aggregate produced by burning an earth or soft rock found in Southern California. It is reported that retorts for making it are soon to be erected near Pasadena, Calif. Lightweight aggregate building units combined with a steel frame are being used in a house in Flintridge, Calif. It is owned by James Cruze, moving picture director.

An ordinance authorizing City Manager P. A. Lewis of Springfield, Ohio, to get bids and enter into a contract for the purchase of concrete pipe was passed in April. Total probable contract will be for over \$50,000 to include 1,960 ft. of 48-in. concrete pipe; 1,900 ft. of 54-in.; 1,100 ft. of 60-in.; 1,230 ft. of 66-in. and 640 ft. of 72-in. concrete pipe for Sections E, F and G of the Buckeye Creek interceptor sewer.

Bedford Hills Concrete Products Co., Bedford Hills, N. Y., announced completion recently of a special test by the Hall Test Laboratories on its "Floform" floor made of precast concrete joists. The test was conducted upon a floor of about 140 sq. ft. in area, and a total dead weight of 26,932 lb. was placed upon the floor before a crack appeared in its center. The floor is constructed of concrete joists upon which are laid cinder blocks surfaced with concrete. Builders witnessed the test. Three residence jobs involving the use of precast concrete joists recently have been sold by this company.

Obituaries

W. H. Kleckner, 66, for many years superintendent of the Lehigh Portland Cement Co.'s mill at New Castle, Penn., died March 10 at his home in New Castle.

Kay I. Church, 36, field engineer for the Portland Cement Association was killed April 2 near Marion, Kan., when his automobile went into a ditch. Mr. Church had lived in Wichita since 1923.

Frank F. Gallagher, 49, treasurer and a director of the Goodwin-Gallagher Sand and Gravel Corp., New York, N. Y., died April 6 as a result of a February accident. He had been a director of the Metropolitan Sand Co.

Daniel Foley, 77, died at his home in Chicago, April 19. He was vice-president of the Moulding Brownell Corp. and president of the Federal Stone Co. Mr. Foley was born in Lemont, April 25, 1852. He came to Chicago 57 years ago.

Edwin T. Nugent, 57, vice-president of Rockwood Corp. engaged in marketing gypsum, board and vice-president of the

Douglass Loan and Investment Co. died March 12 in St. Louis, Mo. He was a son of the late Byron Nugent, founder of B. Nugent and Bro. Dry Goods Co.

Judge M. F. Viernow, 81, pioneer quarry operator of Carthage, Mo., died March 25. He had been a justice of the peace in Carthage for the last 24 years. As a member of the Carthage Marble and White Lime Co. in 1877, he installed the first quarry machinery in southwest Missouri. The Carthage Superior Limestone Co. was formed in 1895 with Mr. Viernow as a firm member.

Christopher Minsinger, president of the Star Sand and Gravel Co., Portland, Ore., died at his home, March 30. He was born in Pittsburgh, Pa., in 1855. His father, a native of Germany, was long in the sand and gravel business in Pennsylvania. Business association with his father was interrupted in 1876 when the late Christopher Minsinger went to Japan. Upon his return he organized the Star Sand Co. of Pittsburgh and afterward the Iron City Sand Co. into which was merged the Star and other companies. Following his arrival in 1889 at Portland he organized the Star Sand Co. of which he was president.

Edwin Struckmann, 62, general superintendent of the western division of International Cement Co., died March 15 in Kansas City, Mo. He had been superintendent about five years with several plants, including those at Houston and Dallas, Tex., under his jurisdiction. A brother, Holger Struckmann, whose death occurred four months before was president of the International Cement Co. The late Edwin Struckmann held degrees in engineering from the University of Copenhagen, in his native Denmark, and from the University of Edinburgh in Scotland. The Struckmanns came to the United States in 1907.

Manufacturers

Gifford-Wood Co., Hudson, N. Y., is observing its 120th anniversary.

Falk Corp., Milwaukee, Wis., announces appointment of David Adams as district sales manager to succeed W. O. Beyer.

Hercules Motors Corp., Canton, Ohio, announces Oliver Kelly as representative in San Francisco for the Pacific Coast section.

Magnolia Metal Co., Elizabeth, N. J., announces development of a new form of bearing bronze. Magnolia bronze bushings are semi-finish on the inside as well as outside.

Walsh Refractories Corp., St. Louis, Mo., has purchased North Missouri Refractories Co. of Vandalia, Mo. N. S. Chouteau Walsh is president.

Superheater Co., New York, N. Y., announces appointment of sales agents in Kansas City, San Francisco, New Orleans, Birmingham, Charlotte, Memphis, Houston, Denver and Seattle.

Meriam Co., Cleveland, Ohio, has developed a new type of manometer fitted with electric control features. It is said to be adaptable to a wide variety of direct and differential control uses for pumps, sprinkler systems, etc.

Westinghouse Electric and Manufacturing Co., East Pittsburgh, Penn., reports orders booked for the first quarter of 1934 were almost 50 percent greater in dollar value than the bookings were in the same quarter of last year.

MacWhyte Co., Kenosha, Wis., announce a 10 percent wage increase April 9 for employees in its wire rope and cable plant. The Pittsburgh address of MacWhyte Co. now is 704 Second Avenue.

General Electric Co., Schenectady, N. Y., announces an increase of 50 percent first quarter 1934 orders over the corresponding period last year. Total orders for the three months amounted to more than \$25,000,000.

Stephens-Adamson Mfg. Co., Aurora, Ill., is reopening sales engineering offices at Pittsburgh, Penn., and Huntington, W. Va. The Pittsburgh office is under the supervision of H. W. Banbury. D. W. Allen, conveyor expert is in charge of the West Virginia district.

Cross Engineering Co., Carbondale, Penn., has appointed A. R. Young, 209 Northern Bldg., Indianapolis, Ind., as sales representative for them in the state of Indiana. McVay Hausman, Marx Building, Birmingham, Ala., has been appointed as southern sales representative for them.

Robins Conveying Belt Co., New York, N. Y., has appointed Fred Bathke, as sales agent in St. Paul, Minn., and Raymond Church, Cincinnati, Ohio, as sales agent in the territory including the southwestern part of Ohio and southeastern part of Indiana and the western part of Kentucky.

Lukenweld, Inc., division of Lukens Steel Co., Coatesville, Penn., announces election of Everett Chapman as vice president.

Robins Conveying Belt Co., New York, N. Y., announces that M. S. Lambert, formerly manager of the Detroit office, is now manager of merchandise sales, New York.

H. D. James, formerly connected with the Westinghouse Electric and Manufacturing Co., has opened an engineering consulting service to specialize in industrial and building problems.

Allis-Chalmers Manufacturing Co., Milwaukee, Wis., has appointed E. F. Bilsland manager of the Chicago district office. **A. J. Cooper** has been appointed assistant manager of the New York district office.

Babcock and Wilcox Tube Co., New York, N. Y., announces that the territory served by its Tulsa office, managed by C. J. Hochbauer, has been enlarged to include all of Oklahoma and the southern half of Kansas.

Independent Pneumatic Tool Co., Chicago, Ill., announces a new portable air-operated pump especially designed to meet the modern sump pump requirements of quarries, mines, contractors and industrial users generally.

J. F. Roche, executive vice president of Binks Manufacturing Co., Chicago, Ill., has been requested to serve President Roosevelt's National Emergency Council as a member of the State Advisory Board.

General Electric Co., Schenectady, N. Y., announces 32 awards to employees of the company through the Charles A. Coffin Foundation for contributions to the "progress and prestige of the company in the advance of electric art."



J. F. Roche

Joseph T. Ryerson and Son, Inc., Chicago, Ill., announce appointment of Harvey Dietrich as assistant vice president in charge of operations for the structural and special order departments in Chicago. **A. Y. Sawyer** has been appointed assistant general manager of sales.

Patterson Foundry and Machine Co., East Liverpool, Ohio, producing equipment for pulverizing, grinding, etc., announces a new office in Detroit, Mich., with E. L. Grimes in charge as district manager. **L. H. Burkhardt, Jr.**, has been appointed to handle territory in northern New York state and western Pennsylvania.

Chain Belt Co., Milwaukee, Wis., has appointed Intermountain Equipment Co., Boise, Ida., as exclusive distributor of its equipment in the Boise territory. The Milwaukee concern has completed transfer to Milwaukee of all of the manufacturing operations of its subsidiary, Stearns Conveyor Co., formerly of Cleveland, Ohio.

Trade Literature

Shovels. Eight page Bulletin 71 describes type 701 shovel, dragline and crane. **OHIO POWER SHOVEL CO.**, Lima, Ohio.

Metal Finish. Pamphlet on the use of fluted "Chromflex" finish for industrial exhibits. **APOLLO METAL WORKS**, La Salle, Ill.

Refractories. Descriptive bulletin just issued on "Carbex Silicon Carbide Brick." **O. S. TYSON AND CO., INC.**, New York, N. Y.

Compressors. Bulletin HAC-36 illustrates and describes duplex two-stage horizontal compressors. **GARDNER-DENVER CO.**, Quincy, Ill.

Meters. Electric flow meters with regulation chart equipment, etc., fully described in broadside. **BROWN INSTRUMENT CO.**, Philadelphia, Penn.

Diesel Engines. Thirty page booklet describes and illustrates the design of Buckeye Diesel engines in some detail. **BUCKEYE MACHINE CO.**, Lima, Ohio.

Couplings. Loose leaf bulletin 501 described Falk-Rawson 4-duty coupling. New dimensions given and reduced schedule of prices. **FALK CORP.**, Milwaukee, Wis.

Shovels. A $\frac{3}{4}$ yard machine announced in broadside form with statement that "it carries no experimental design." **BUYURUS-ERIE CO.**, South Milwaukee, Wis.

Scales. Improved dial mechanism emphasized in 18-page illustrated booklet on large and small capacity scale units. **KRON CO.**, Bridgeport, Conn.

Lubrication. Electric motor lubrication in No. 3 of volume 20 (March 1934) sectional motor views and their lubricant recommendation. **TEXAS CO.**, New York, N. Y.

Pumps. Two page leaflet featuring internal bronze bearing pumps (rotary) shows liquid-handling efficiency. **WORTHINGTON PUMP AND MACHINERY CORP.**, Harrison, N. J.

Converters. Bulletin 502-B and 509-A describe inverted rotary converters and frequency converters. **LOUIS ALLIS CO.**, Milwaukee, Wis.

Wire Rope. Sixteen page booklet mainly devoted to illustration of wire rope on heavy duty service on construction projects. **A. LESCHEN AND SONS ROPE CO.**, St. Louis, Mo.

Cast Iron. Volume 5, No. 1, *Nickel Cast Iron News*, carries articles on hardening and tempering cast iron metal, etc. **INTERNATIONAL NICKEL CO., Inc.**, New York, N. Y.

Motors. Twenty-four page illustrated news bulletin on motor equipment developed in magazine style as Lou's Allis Messenger, March-April issue. **LOUIS ALLIS CO.**, Milwaukee, Wis.

Shovels. Bulletin 38 contains specifications, working range data and machinery illustrations of Model-38 shovel of half yard capacity. **BAY CITY SHOVELS, INC.**, Bay City, Mich.

Jackbits. A stock listing of a complete line of all sizes and types of Jackbits with illustrations of Jackbit and Jackbit rod applications. **INGERSOLL-RAND CO.**, Phillipsburg, N. J.

Tractors. New 44-page catalog illustrates and describes the third model of the company's line. Special emphasis on Diesel power units. **CATERPILLAR TRACTOR CO.**, Peoria, Ill.

Capacitors. Twenty-eight page booklet on pyranol-treated capacitors developed from the angle of "improving power-factor for profit." **GENERAL ELECTRIC CO.**, Schenectady, N. Y.

Welding. Year-end Review of welding progress in January, 1934 issue of *Oxy-Acetylene Tips*. Advances in hard-surfacing outlined. **LINDE AIR PRODUCTS CO.**, New York, N. Y.

Paint. Product described with claim that in one application it "primes, protects and enhances the appearance" of industrial surface to which it is applied. **QUIGLEY CO.**, INC., New York, N. Y.

Friction Block. Tabular recommendation with full technical information on friction materials, disc and plate clutches, cone clutches, etc. Four pages. **JGHNS-MANVILLE**, New York, N. Y.

Transmission. Five folders in series show latest developments in pivoted motor drive bases. Special reference to ceiling and vertical types. **ROCKWOOD MANUFACTURING CO.**, Indianapolis, Ind.

Wire Cloth. Twenty-four page booklet No. 14 gives a complete stock listing of steel, brass, bronze and copper wire cloths. Specialty metal cloths also listed. **AUDUBON WIRE CLOTH CORP.**, Philadelphia, Penn.

Idlers. Special reference to rock and sand and gravel handling in broadside "Bulk Handling by Belt." Illustrations show applications of anti-friction bearing idlers on conveyors. **CHAIN BELT CO.**, Milwaukee, Wis.

Compressors. Eight page illustrated folder outlines technical information on single, horizontal, single stage, steam and motor driven compressors of 11 and 13 in. stroke. **WORTHINGTON PUMP AND MACHINERY CORP.**, Harrison, N. J.

Firebrick Bond. Discussion and recommendations in folder on application of fire-clay brick and other refractories and their proper bonding materials. **HARBISON-WALKER REFRACTORIES CO.**, Pittsburgh, Penn.

Drills. Wagon drill WD-33 is described with full specifications and descriptions of its various uses in deep rock cuts, general rock excavation, etc. **WORTHINGTON PUMP AND MACHINERY CORP.**, Harrison, N. J.

Pumps. Bulletin No. 223 describes full line of motor pumping units. Twelve pages interspersed with diagrams, charts and machine illustrations. **PENNSYLVANIA PUMP AND COMPRESSOR CO.**, Easton, Penn.

Trailers. "Executive Thinking" is a distinctively prepared booklet with its brief text in terms of reduced costs, "liberating

capital and efficiency in product distribution." **FRUEHAUF TRAILER CO.**, Detroit, Mich.

Motors. Illustrated leaflet No. 20609 describes singlephase repulsion-start induction motors available for 110-220 volt, 25 to 60 cycle service in sizes from $\frac{3}{4}$ to 3 hp. **WESTINGHOUSE ELECTRIC AND MANUFACTURING CO.**, East Pittsburgh, Penn.

Mills, classifiers, etc. Brief description of each product in the company's line which includes, conical ball and pebble mills, pulverizers, rod mills, tube mills, classifiers, feeders, screen units, kiln and sanitation equipment. **HARDINGE CO.**, York, Penn.

Explosives. Annual report of Bureau for the Safe Transportation of Explosives and other Dangerous Articles shows railroad traffic in dynamite and black powder effected without a single fatality. **INSTITUTE OF MAKERS OF EXPLOSIVES**, New York, N. Y.

Pipe Line. "Pumpcrete" equipment fully described and illustrated in the 24-page magazine size Rotogravure. Use of equipment shown on projects such as railroad tunnels, river improvement work and bridge developments. **CHAIN BELT CO.**, Milwaukee, Wis.

Helmets. Four page folder illustrates and describes uses of Helmet units which include headgear, pressure reducer, air filter, purifier and pressure gauge. Equipment calls for $\frac{1}{4}$ in. pipe line for air supplied to helmet. **W. W. SLY MANUFACTURING CO.**, Cleveland, Ohio.

Air Compressors. Small (Type VS) air compressor units described and illustrated with features such as start and stop control, v-belt drives, silent suction muffler and cleaner, etc. Vertical mountings. **WORTHINGTON PUMP AND MACHINERY CORP.**, Harrison, N. J.

Hoists. Full description of a hoist type widely used with scrapers for handling heavy materials in mines and quarries, for car pulling, etc. Reference to operation of this equipment in gravel pits and cement operations. Catalog No. 1860-B-38 pages. **INGERSOLL-RAND CO.**, Phillipsburg, N. J.

Thermometers. Thirty-two page catalog features resistance thermometer for measuring temperatures from -300 deg. to +1000 deg. F. Features described include electric chart drive, combination door handle and lock-and-toggle switch for chart drive. **BROWN INSTRUMENT CO.**, Philadelphia, Penn.

Gears. New 440-page catalog on gears lists completely all the company's types of gears, giving catalog numbers and prices, etc. Nearly all numbers of teeth are included: 108 pages of gear engineering, horsepower ratings and tooth loads for gears, etc. **THE HORSBURGH AND SCOTT CO.**, Cleveland, Ohio.

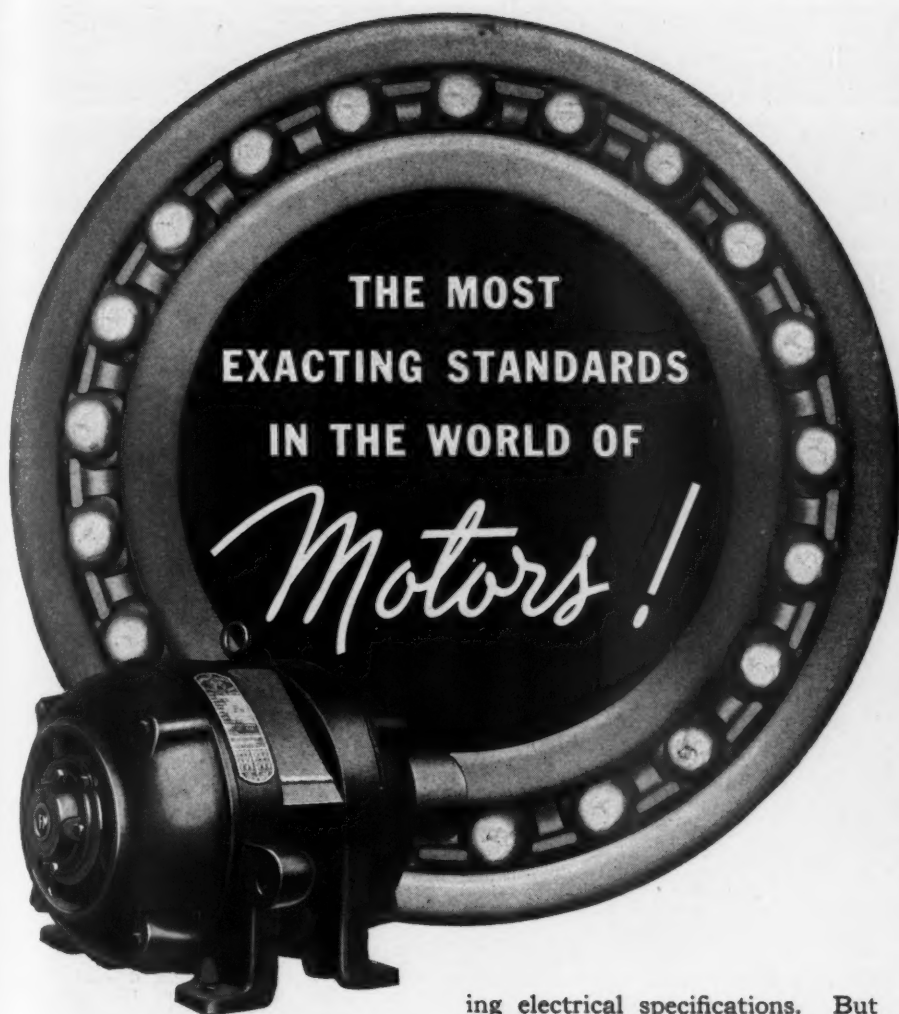
Transmission. Revised leaflet No. 2134-A gives engineering data such as sheave diameters, number of grooves, bores and other dimensions on sheaves for V-belt drives. Specification tables and illustrated installation references in four pages. **ALLIS-CHALMERS MANUFACTURING CO.**, Milwaukee, Wis.

Highway Surfacing. Twelve page illustrated booklet reports on "Road Soil Stabilization." Treatment described for highways previously surfaced with aggregate, new grades not surfaced with aggregates (in clay or sandy soils), and the construction of a new mat on an old base. **COLUMBIA ALKALI CORP.**, Barborton, Ohio.

Crushers. "Tel-smith Wheeling Jaw Crushers and Portable Outfits" is a 20-page booklet describing unit design as to crushing plants for production of small rock in large tonnages, general utility crushers, portable crushing, screening and loading units complete with latest equipment. **SMITH ENGINEERING WORKS**, Milwaukee, Wis.

Refractories. Bulletin 306 describes "Q-Chrome" designed for furnace construction and maintenance. Manufacturers describe this product as "a neutral-base refractory cement" for laying firebrick, etc., subject to extreme temperatures and destructive slagging chemical or abrasive conditions. Softening point said to be above 3400 deg. F. **QUIGLEY COMPANY, INC.**, New York, N. Y.

Welding. Advantage of one piece interchangeable lip for manganese steel dipper outlined. Miscellaneous information on nickel manganese rods for rebuilding gravel producers' steel pump parts, etc. Some non-technical data and plant news. Sixteen page illustrated folder: Volume 6, No. 1, *Amisco Bulletin*. **AMERICAN MANGANESE STEEL CO.**, Chicago Heights, Ill.



... you get more features with F-M Motors

Fairbanks-Morse pioneered many of the standards of the present day motor building industry.

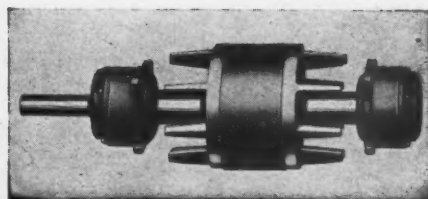
Today the pioneering still goes on—pioneering to create the standards of the industry of tomorrow. But F-M pioneering is an *exacting* pioneering! It is a developed method of building motors better *mechanically*—building them better to serve you longer at lower maintenance expense.

These motors meet the most exact-

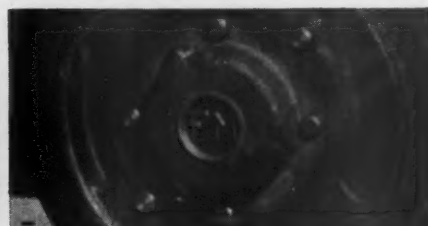
ing electrical specifications. But with characteristic thoroughness, Fairbanks-Morse has achieved a position of leadership in *mechanical* construction.

Fairbanks-Morse pioneered *mechanical excellence* in electric motors. It pioneered *ball bearings*, *grease tube lubrication*, *one-piece rotor construction*.

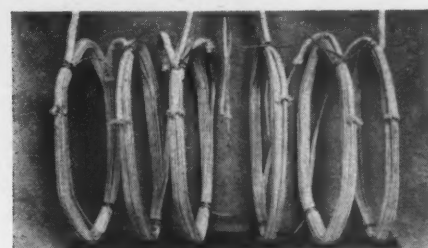
Pioneers in motor building progress, Fairbanks-Morse asks only an investigation of how much *more* these motors have to offer. Start your investigation by writing for full information. Address Fairbanks, Morse & Co., 900 S. Wabash Avenue, Chicago, Ill.



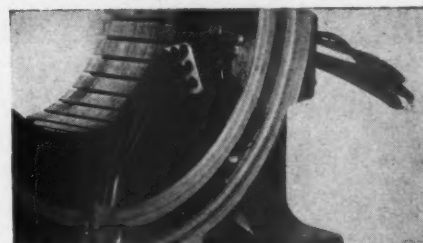
Complete rotor assembly with cartridge-type sealed ball bearings. Note rotor winding is of one-piece construction.



Lubricate sealed ball bearings once a year with tube contained lubricant. Bearings, dust tight. No lubrication drip.



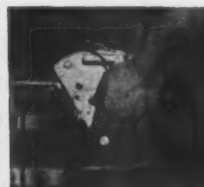
Group wound coils—an entire phase group in a single piece of wire—lead connections from each group *welded*, not soldered or brazed.



Sealed-in leads through frame opening—anchored permanently. No chance for strain on field leads.



Slot insulation — self locking by means of cuff construction — permanent and additional protection for field windings.



Final vibrometer test—one of a series to insure a smooth running motor with minimum vibration.

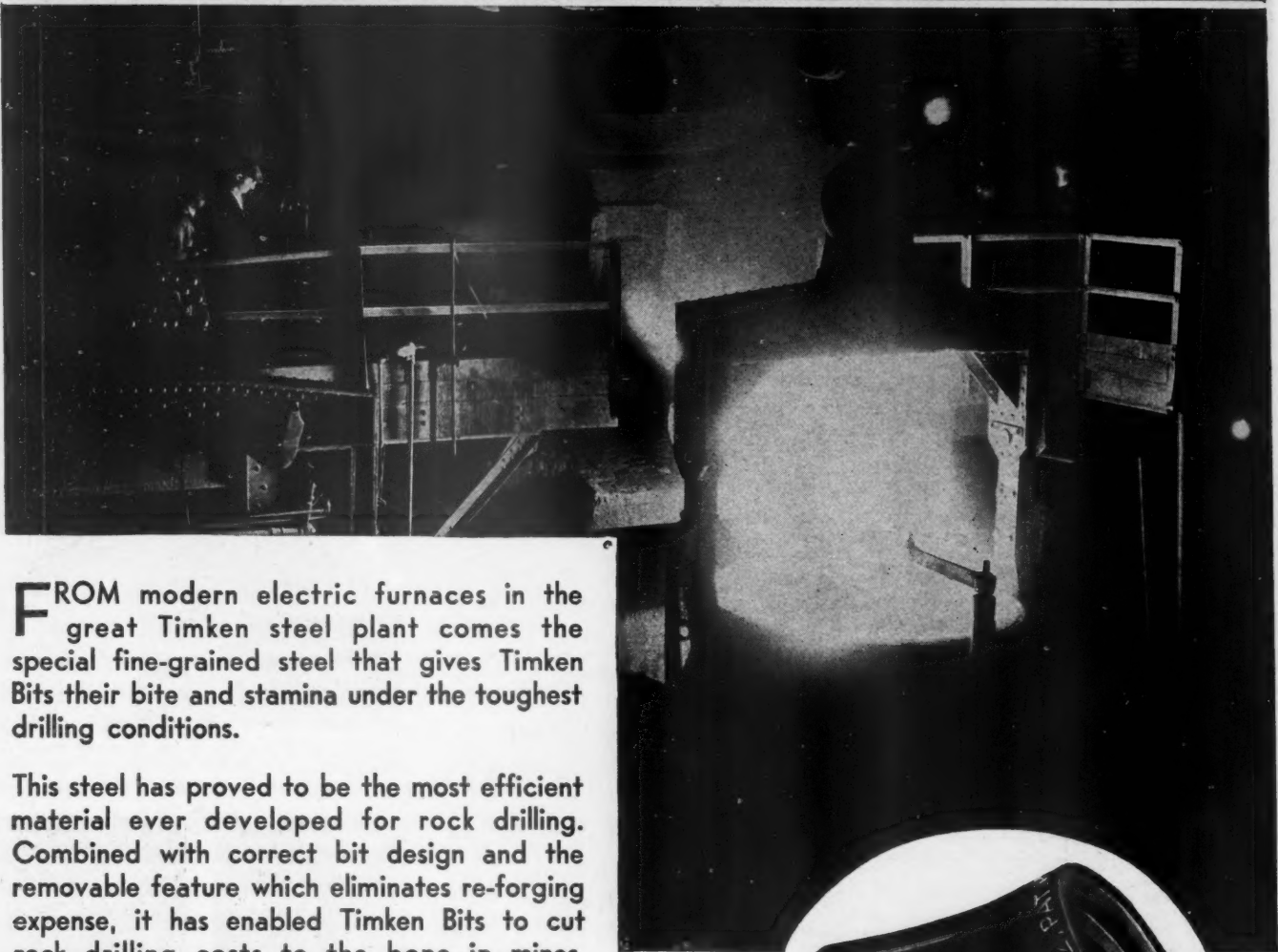
Pioneer
Designers
and
Manufacturers
of
POWER, PUMPING AND WEIGHING EQUIPMENT
104 Years

**FAIRBANKS-MORSE
MOTORS**

POWER, PUMPING AND WEIGHING EQUIPMENT

6094-EA40.62

The Source of Longer Drilling Life in **TIMKEN ROCK BITS**



FROM modern electric furnaces in the great Timken steel plant comes the special fine-grained steel that gives Timken Bits their bite and stamina under the toughest drilling conditions.

This steel has proved to be the most efficient material ever developed for rock drilling. Combined with correct bit design and the removable feature which eliminates re-forging expense, it has enabled Timken Bits to cut rock drilling costs to the bone in mines, quarries and construction work.

Give Timken Bits a trial and see how much quicker, better and cheaper you can drill your shot holes. We will gladly cooperate in any test you may suggest. Write for further information.

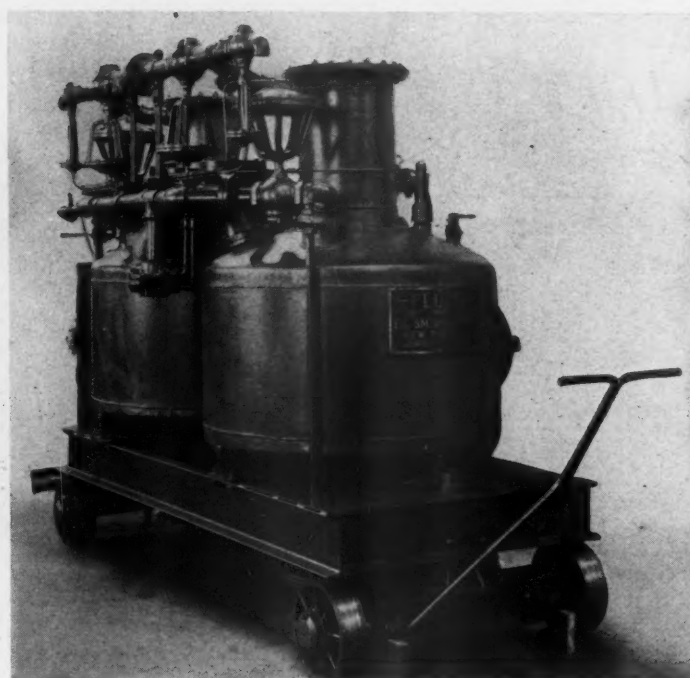
THE TIMKEN ROLLER BEARING COMPANY, CANTON, OHIO

TIMKEN BITS

THE FLUXO PUMP

● FOR PNEUMATIC TRANSPORT ●

Automatic and
flexible, low
power con-
sumption,
minimum
attention



No operating
parts in direct
contact with
the moving
material



Economically transports cement, pulverized dry cement raw mix, dry clay, gypsum, hydrated lime, phosphates, soda, ash, etc.,—from grinding mills to storage—dust collected at packing machines to silos—loading and unloading silos, storage bins, blending bins, etc.

●
Cheapens Silo Construction by Elimination of Tunnels and Deck Slab

●
WRITE FOR CATALOG



F. L. SMIDTH & Co.

Engineers

225 BROADWAY

NEW YORK, N. Y.

BELTS ARE LIKE



Goodrich Conveyor Belting is "standard equipment," on thousands of jobs.

Goodrich

HUMANS.....

they fail for the same reasons

HUMAN FAILURES result from two conditions—the wrong man in the right job, and—impossible working conditions. Conveyor belts fail for the same reasons.

You wouldn't hire an expensive engineer, sight unseen, just by some set of stock specifications. Yet some plants buy belts that way—and then wonder why they fail. Men and belts have to be chosen with supreme skill, for the exact job each is to do.

Having hired a man, you wouldn't hurl him into conditions certain to make him fail. Yet many a plant permits conditions in the loading or unloading equipment, or features in the arrangement of idlers, pulleys, trippers, take-up equipment, which cannot help but shorten belt life.

To avoid human failures in your plant, you may have to be a personnel wizard, but to avoid premature belt failures, all you have to be is a Goodrich customer.

By working with you to engineer each belt to its task, and to eliminate every possible cutting, gouging, wearing condition, Goodrich field men prolong belt life at the outset. They lock the barn *before* the horse is stolen.

Try this new kind of service on your next belt order. You'll be amazed at the way belt cost per ton goes down. The B. F. Goodrich Rubber Company, Mechanical Rubber Goods Division, Akron, Ohio.



Perfect troughing with Goodrich Conveyor Belts.

GOODRICH MECHANICAL RUBBER GOODS FOR THE ROCK PRODUCTS INDUSTRY INCLUDE:

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- Hard Rubber Goods.
- Molded Rubber Products.
- Packing . . . and
- A Complete Line of Miscellaneous Rubber Items.

ALL *products* *problems* IN RUBBER



Conveyor Belting

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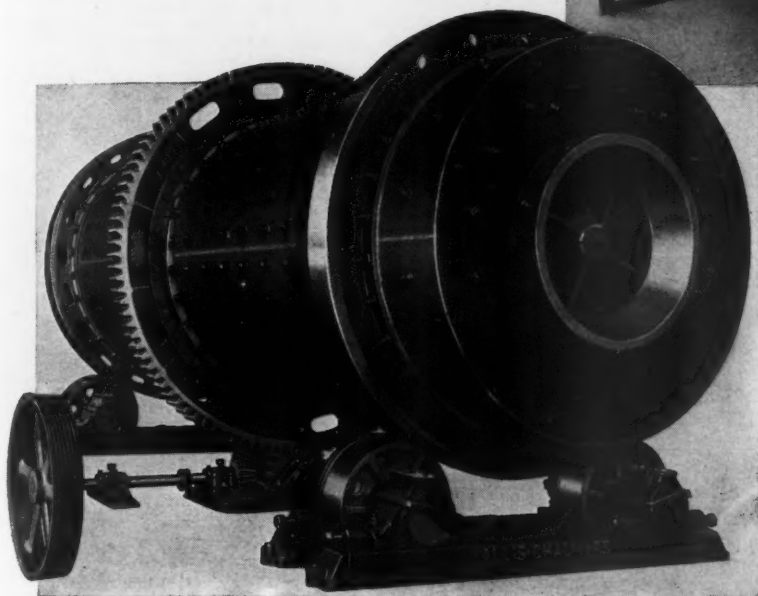
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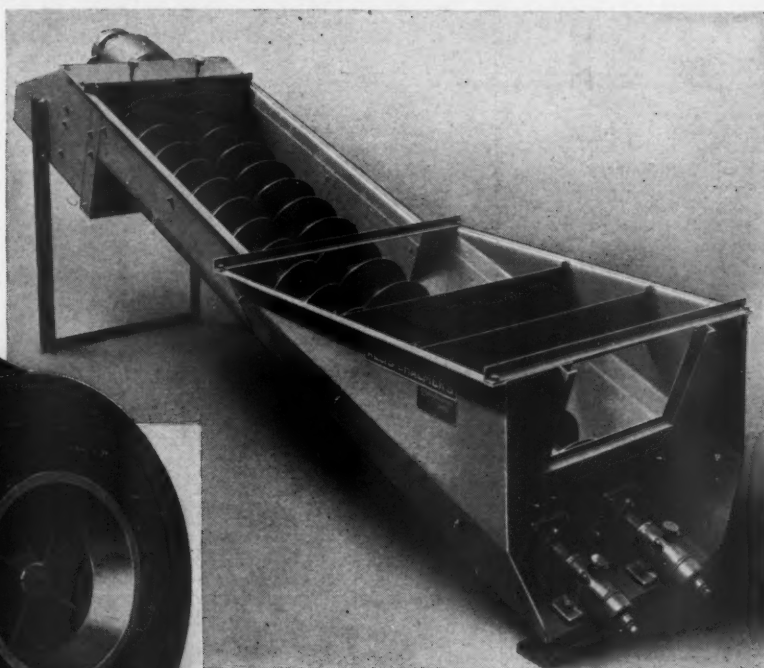
- Acetylene Welding Rod**
American Steel & Wire Co.
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- Compressed Air Hoists**
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Link-Belt Co.
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- Cranes (Overhead Traveling Electric)**
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- Crushers (Hammer)**
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- Crushers (Jaw and Gyratory)**
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- Dragline Cableway Excavators**
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- Dredges**
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- Drills (Rock)**
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- Engineers**
Productive Equipment Corp.
F. L. Smidth & Co.

If Washed Aggregates are Necessary

Call on ...
Allis-Chalmers



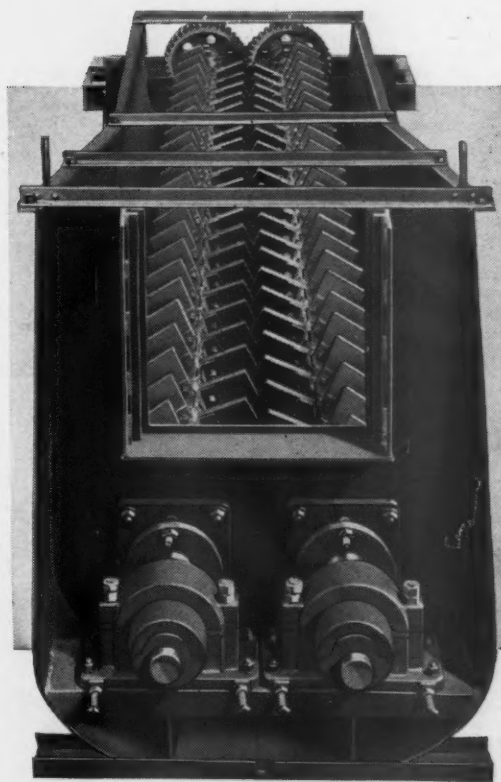
Revolving Stone Scrubber



Double Screw Sand Washer with Gearmotor Drive. Washers can also be supplied with sprocket and gear drive.

THE selection of the proper equipment to produce clean aggregates requires careful consideration, whether it is for a plant which has been operating dry or for a new washing plant. The experience of the Allis-Chalmers Manufacturing Company in the manufacture of equipment required for plants producing commercial aggregates dates from the industry's infancy, and this experience is reflected in the design and application of its products.

Allis-Chalmers builds a complete line of scrubbers, log washers, sand washers, scrubber screens, and vibrating screens, especially designed for washing aggregates. As each has its particular application we suggest you call on our nearest district office for further information.



20" x 17' Double Screw Log Washer for stone and gravel.

ALLIS-CHALMERS

— Allis-Chalmers Manufacturing Company, Milwaukee —

Classified Directory of Advertisers in this Issue of ROCK PRODUCTS

For alphabetical index, see page 2

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Fairbanks, Morse & Co.
Ingersoll-Rand Co.

Engines (Gas, Kerosene, Oil)
Fairbanks, Morse & Co.

Engines (Steam)
Morris Machine Works

Excavating Machinery (See Shovels, Cranes, Buckets, etc.)

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Fuller Co. (Cement and Pulverized Material)
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Smith Engineering Works (Plate)

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Cross Engineering Co.

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Forges (Oil)
Gardner-Denver Co.

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Fuses (Electrical)
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Fuses (Detonating and Safety)
Ensign-Bickford Co.

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General Electric Co.
Link-Belt Co.

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Hayward Co.

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Jeffrey Mfg. Co. (Vibrating)
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Traylor Eng. & Mfg. Co.

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Flexible Steel Lacing Co.

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Linings (Iron for Ball and Tube Mills) (See Mill Liners)

Linings (Rubber for Ball and Tube Mills)
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Locomotives (Diesel)
The Fate-Root-Heath Co.
Plymouth Locomotive Works
Whitcomb Locomotive Co.

Locomotives (Diesel-Electric)
The Fate-Root-Heath Co.
Plymouth Locomotive Works
Whitcomb Locomotive Co.

Locomotives (Electric)
Jeffrey Mfg. Co.

Locomotives (Gas Electric)
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Plymouth Locomotive Works
Whitcomb Locomotive Co.

Locomotives (Oil Electric)
The Fate-Root-Heath Co.
Plymouth Locomotive Works
Whitcomb Locomotive Co.

Locomotives (Steam, Gas and Electric)
General Electric Co.
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Whitcomb Locomotive Co.

Locomotives (Storage Battery)
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Jeffrey Mfg. Co.
Whitcomb Locomotive Co.

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American Manganese Steel Co.
The Frog Switch & Mfg. Co.

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Manganese Steel Forge Co.,
Manganese Steel Parts
American Manganese Steel Co.
Manganese Steel Forge Co.,

Mechanical Rubber Goods
B. F. Goodrich Rubber Co.
United States Rubber Co.

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Gruendler Crusher & Pulv. Co.
Raymond Bros. Impact Pulv. Co.

F. L. Smidth & Co.
Traylor Eng. & Mfg. Co.
Williams Patent Crusher & Pulv. Co.

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F. L. Smidth & Co.

Mine Handling Equipment
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Gruendler Crusher & Pulv. Co.

Mixers (Concrete)
Jaeger Machine Co.
Koehring Company, Div. of National Equip. Corp.

Motor Trucks
General Motors Truck Co.

Motor Truck Scales
Fairbanks, Morse & Co.

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Allis-Chalmers Mfg. Co.
Fairbanks, Morse & Co.
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Nozzles (Gravel Washing)
Chain Belt Co.

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Babcock & Wilcox Co.

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Gulf Refining Co.

Overhead Traveling Cranes
Curtis Pneumatic Machy. Co.

Packing
United States Rubber Co.

Packings (Pump, Valve, Etc.)
B. F. Goodrich Rubber Co.
United States Rubber Co.

Pavers
Koehring Company, Div. of National Equip. Corp.

Perforated Metal
Chicago Perforating Co.
Cross Engineering Co.
Harrington & King Perforating Co.

Hendrick Mfg. Co.
Morrow Mfg. Co.

Plate (Double Corrugated)
Hendrick Mfg. Co.

Plate Work
Hendrick Mfg. Co.

Plates
Cross Engineering Co.

Pneumatic Drills (See Drills)

Portable Conveyors
Fuller Company
Link-Belt Co.

Portable Crushing and Screening Unit
Smith Engineering Works
Williams Patent Crusher & Pulv. Co.

Power Units
Fairbanks, Morse & Co.

Power Transmission Equipment
Chain Belt Co.
S K F Industries, Inc.

Pulverizer Parts
American Manganese Steel Co.

Pulverizers (See also Crushers, Mills, etc.)
Allis-Chalmers Mfg. Co.
Babcock & Wilcox Co.
Dixie Machy. Mfg. Co.
Gruendler Crusher & Pulv. Co.
Jeffrey Mfg. Co.
Raymond Bros. Impact Pulv. Co.
F. L. Smidth & Co.
Williams Patent Crusher & Pulv. Co.

Pumps (Air Lift)
Ingersoll-Rand Co.
Fuller Co.

Pumps (Cement)
Fuller Co.

Pumps (Cement Slurry)
American Manganese Steel Co.
Morris Machine Works
F. L. Smidth & Co.
A. R. Wilfley & Sons

Pumps (Centrifugal)
Allis-Chalmers Mfg. Co.
Fairbanks, Morse & Co.
Ingersoll-Rand Co.
Morris Machine Works
A. R. Wilfley & Sons

Pumps (Drainage)
Fairbanks, Morse & Co.

Pumps (Dredging)
American Manganese Steel Co.

Bucyrus-Erie Co.
Morris Machine Works

Pumps (Pulverized Coal)
Babcock & Wilcox Co.

Pumps (Sand and Gravel)
Allis-Chalmers Mfg. Co.
American Manganese Steel Co.
Ingersoll-Rand Co.
Morris Machine Works
A. R. Wilfley & Sons

Railway Equipment
General Electric Co.

Railways (Electric)
General Electric Co.

Ready-Mixed Concrete (Truck Mixer Bodies)
Chain Belt Co.

Ready-Mixed Concrete Plants
Blaw-Knox Co.

Road Machinery
Good Roads Machy. Corp.
Harnischfeger Corp.
Koehring Company, Div. of National Equip. Corp.
Marion Steam Shovel Co.
Whitcomb Locomotive Co.

Rock Drills (See Drills, Rock)

Roll Mills
Traylor Eng. & Mfg. Co.

Roller Bearings
S K F Industries, Inc.
Timken Roller Bearing Co.

Roofing and Siding (Steel)
Joseph T. Ryerson & Son, Inc.

Rope, Wire (See Wire Ropes)

Rubber Covered Screens
B. F. Goodrich Rubber Co.

Sand Drag
Smith Engineering Works

Sand Settling Tanks
Link-Belt Co.
Smith Engineering Works

Scales (Automatic Proportioning)
Fairbanks, Morse & Co.

Scales (Cement)
Fairbanks, Morse & Co.

Scales (Railway Track and Truck)
Fairbanks, Morse & Co.

Scrapers (Power Drag)
Harnischfeger Corp.
Link-Belt Co.
Sauerman Bros

Screens
Allis-Chalmers Mfg. Co.
American Manganese Steel Co.
Bartlett, C. O., & Snow Co.
Chicago Perforating Co.
Cross Engineering Co.
Good Roads Machy. Corp.
Harrington & King Perf. Co.
Hendrick Mfg. Co.
Huron Industries, Inc.
Jeffrey Mfg. Co.
Link-Belt Co.
Manganese Steel Forge Co.,
Morrow Mfg. Co.
Productive Equipment Corp.
John A. Roebling's Sons Co.
Simplicity Engineering Co.
Smith Engineering Works
Traylor Eng. & Mfg. Co.
Universal Vibrating Screen Co.

Screens (Perforated)
Hendrick Mfg. Co.

Screens, Scalping (Hercules and Standard)
Smith Engineering Works

Screens (Testing)
Hendrick Mfg. Co.

Screens (Vibrating)
Jeffrey Mfg. Co.
Link-Belt Co.
Productive Equipment Corp.
Simplicity Engineering Co.
Smith Engineering Works
Universal Vibrating Screen Co.
Williams Patent Crusher & Pulv. Co.

Screens, Washing (Hercules, Ajax and Standard)
Smith Engineering Works

Why is KOEHRING "Heavy Duty"?

FIRST because Koehring capacities are rated on an *extra safety margin*

— because every gear, every clutch and every detail is built on an *extra safety margin!*

— because of roller and ball bearings operating in oil bath gear cases, minimizing wear and friction losses

— because of *excess power and weight*

— because of rigid standards of engineering and construction and no compromise

in materials, the Koehring is the *Heavy Duty* excavator distinctive above all others!

And in addition there is Koehring smooth functioning and responsive, easy control.

In performance, low-cost yardage, low maintenance — long service-life — in *pay-dirt output of the dipper* — the Heavy Duty Koehring is your most profitable shovel investment. Ask us for further proof!



KOEHRING Shovel

K O E H R I N G C O M P A N Y

MILWAUKEE

Division of National Equipment Corporation

WISCONSIN

Classified Directory of Advertisers in this Issue of ROCK PRODUCTS

For alphabetical index, see page 2

Screw, Rewasher (Single and Twin)
Smith Engineering Works

Seal Rings
Traylor Eng. & Mfg. Co.

Separators (Slurry)
F. L. Smidth & Co.

Shovels, Power (Steam, Gas, Electric, Diesel, Oil)
Bucyrus-Erie Company
Harnischfeger Corp.
Koehring Company, Div. of National Equipment Corp.
Link-Belt Co.
Marion Steam Shovel Co.
Michigan Power Shovel Co.
Ohio Power Shovel Co.

Silos
F. L. Smidth & Co.

Skin Hoists and Skips
Link-Belt Co.

Slings (Wire Rope)
American Steel & Wire Co.
A. Leschen & Sons Rope Co.
John A. Roebling's Sons Co.
Williamsport Wire Rope Co.

Sockets (Wire Rope)
American Steel & Wire Co.

Speed Reducers
Huron Industries, Inc.
Link-Belt Co.
Traylor Eng. & Mfg. Co.

Spouts, Chutes (See Chutes and Chute Liners)

Sprockets and Chain
Chain Belt Co.
Jeffrey Mfg. Co.

Steam Shovel Repair Parts
American Manganese Steel Co.

Steel Bars
Timken Roller Bearing Co.

Steel (Bars, Shapes, Plates, etc.)
Joseph T. Ryerson & Son, Inc.

Steel (Electric Furnace)
Timken Roller Bearing Co.

Steel (Open Hearth)
Timken Roller Bearing Co.

Steel (Special Alloy)
Timken Roller Bearing Co.

Steel (Special Analysis)
Timken Roller Bearing Co.

Stokers
Babcock & Wilcox Co.
Combustion Engineering Corp.

Tanks
Combustion Engineering Corp.
Link-Belt Co.
Hendrick Mfg. Co.

Texrope Belts (for Texrope Drives)
B. F. Goodrich Rubber Co.

Tires and Tubes
B. F. Goodrich Rubber Co.
United States Rubber Co.

Tools (Pneumatic)
Ingersoll-Rand Co.

Tractors
Koehring Company, Div. of National Equipment Corp.

Tramways (Aerial Wire Rope)
American Steel & Wire Co.
A. Leschen & Sons Rope Co.
John A. Roebling's Sons Co.
Williamsport Wire Rope Co.
Transmission Belting (See Belting)

Transmission Machinery
Allis-Chalmers Mfg. Co.

Timken Roller Bearing Co.

Troughs
Cross Engineering Co.

Truck Bodies (Ready Mixed Concrete)
Blaw-Knox Co.

Jaeger Machine Co.

Trucks and Trailers (See Motor Trucks)

Trucks (Mixers)
Jaeger Machine Co.

Trukmixers
Blaw-Knox Co.

Tube Mills (See Mills, Ball, Tube, etc.)

Tube Mill Liners (See Mill Liners)

Tubing (Blasting)
B. F. Goodrich Rubber Co.

United States Rubber Co.

Tubing (Seamless Steel)
Timken Roller Bearing Co.

Wagon Drills
Ingersoll-Rand Co.

Valves (Pump)
B. F. Goodrich Rubber Co.

United States Rubber Co.

Vibrating Screens (See Screens, Vibrating)

Washers (Sand, Gravel and Stone)
Allis-Chalmers Mfg. Co.

Eagle Iron Works
Gruendler Crusher & Pulv. Co.

Link-Belt Co.
Traylor Eng. & Mfg. Co.

Waste Heat Boilers
Combustion Engineering Corp.

Weighing Equipment
Fairbanks, Morse & Co.

Weigh-Mix
Koehring Company, Div. of National Equip. Corp.

Welding and Cutting Apparatus
General Electric Co.
Harnischfeger Corp.

Welding Rod
American Steel & Wire Co.
Joseph T. Ryerson & Son, Inc.
Manganese Steel Forge Co.

Welding Wire
American Steel & Wire Co.
John A. Roebling's Sons Co.

Wire (Manganese Steel)
Manganese Steel Forge Co.

Wire (Rubber Insulated)
United States Rubber Co.

Wire Cloth
Manganese Steel Forge Co.
John A. Roebling's Sons Co.

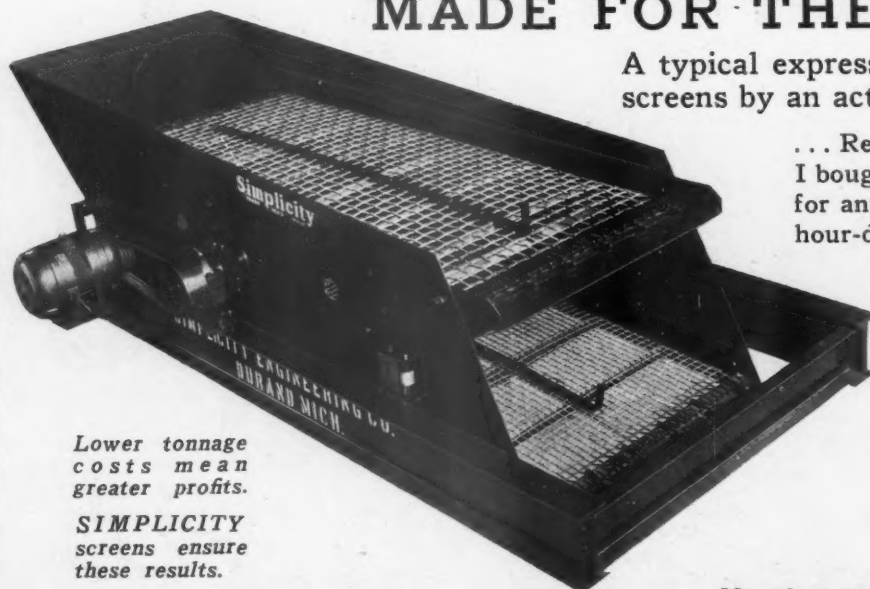
Wire Rope
American Steel & Wire Co.
Hazard Wire Rope Co.
A. Leschen & Sons Rope Co.
John A. Roebling's Sons Co.
Williamsport Wire Rope Co.

Wire Rope Fittings
American Steel & Wire Co.
Hazard Wire Rope Co.
A. Leschen & Sons Rope Co.
John A. Roebling's Sons Co.
Williamsport Wire Rope Co.

Wire Rope Slings (See Slings, Wire Rope)

Wire Rope Sockets (See Sockets, Wire Rope)

The SIMPLICITY GYRATING SCREENS PROVE EVERY CLAIM MADE FOR THEM



Lower tonnage
costs mean
greater profits.

SIMPLICITY
screens ensure
these results.

For Canada
Waterous Limited
BRANTFORD, ONTARIO

A typical expression about SIMPLICITY
screens by an active plant operator.

... Regarding the Simplicity screen, I bought last year, I would not trade for any other screen made. One 10-hour-day output was 704 yards with 3'x6' Simplicity, moving the shovel out of the quarry two times for boulder blasting. Average output 526½ yards per day. For two seasons the repair cost has been practically nothing, only a few rubber bumpers. . . .

"Name on request"

Manufactured and Sold by
Simplicity Engineering Co.
DURAND, MICHIGAN



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when economy is popular
WILLIAMSPORT

is the wire rope you should choose.

By its process of manufacture—and testing—you will find Williamsport more uniform in service. The very close tolerance exacted in our testing laboratories we believe tends to produce longer life in service. A wire rope is only as good as the weakest wires in it and we believe it is poor business to use wires not uniform in strength and other essential characteristics. Because of this we feel you will serve your best interest in using Williamsport.

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Branch Sales Offices:
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LIME PRODUCERS



The Time:—May 23, 24, 25, 1934

The Place:—Edgewater Beach Hotel
Chicago, Illinois

LIME INDUSTRY CONFERENCE

For Consideration Of Many Important Matters Related To Lime Code

— and —

SIXTEENTH ANNUAL CONVENTION NATIONAL LIME ASSOCIATION

A PROGRAM OF VITAL INTEREST TO ALL LIME
MANUFACTURERS HAS BEEN ARRANGED

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YOU ARE CORDIALLY INVITED TO ATTEND
AND PARTICIPATE IN THE DISCUSSION

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REDUCED RAILROAD FARES ON CERTIFICATE PLAN

Pump Slurry With WILFLEYS

Wilfley Centrifugal
Slurry Pumps are made
in sizes ranging from
1 inch to 8 inches, belt
or direct drive.

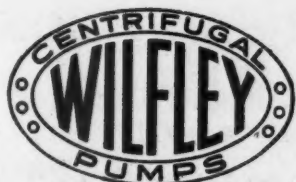
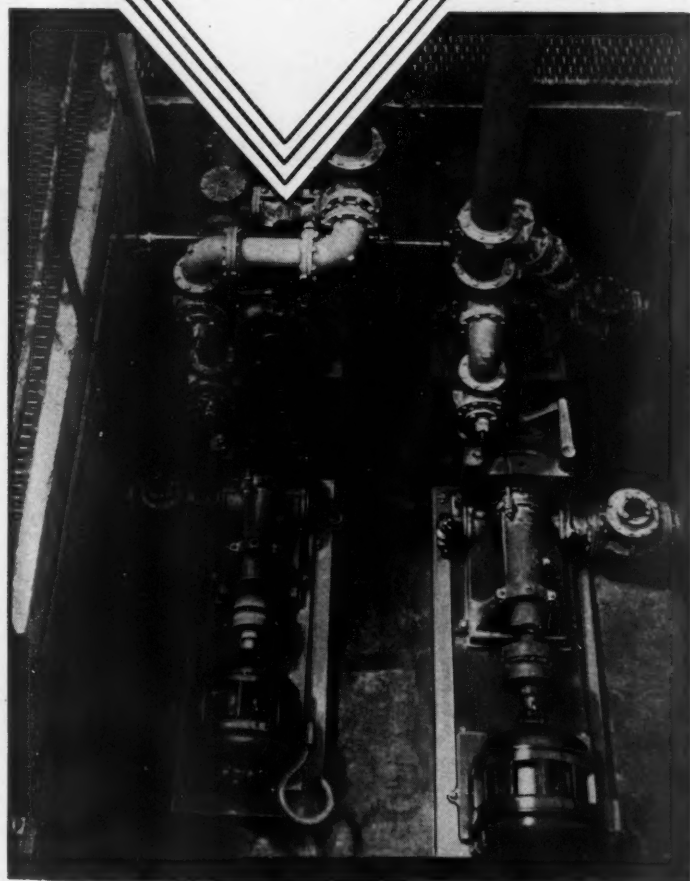
**...and you will be following
the practice of more than 60
wet process cement plants.**

What first attracted these users of
Wilfley Slurry Pumps was one unique
feature of design—a *centrifugal
pump without a stuffing box*. Right
there they could see a maintenance
feature that meant dollars and
cents savings.

So, for this and other reasons,
they put in Wilfleys for pumping
the slurry.

These pumps have proved out in
every way not only in low mainten-
ance and high efficiency but on
reliability. They are giving good
service right along.

A. R. WILFLEY and SONS, Inc.
DENVER, COLORADO, U. S. A.



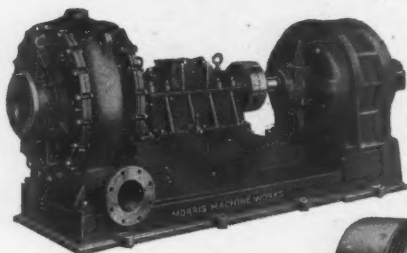
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WILFLEY

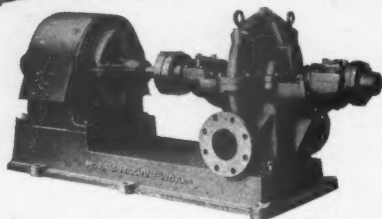
centrifugal SAND PUMPS

PATENTED

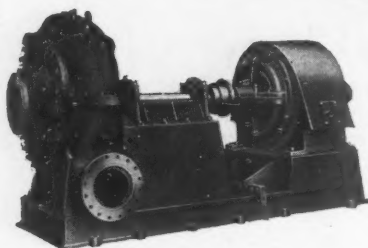
When new
pumping equipment
is to be purchased



GENERAL SERVICE PUMP
The wide range of impellers available for these pumps permits operation at suitable speed with maximum efficiency.



HEAVY DUTY DREDGING PUMP
for economical pumping of highly abrasive solids against high heads. Large diameter for low speed, and special materials for parts subject to wear.



LINED DREDGING PUMP
For handling heavy or sharply abrasive sand and gravel. Special alloy linings save in replacement expense.

YOU will want to know not only the cost but the complete background of the pumps that are offered—their design, workmanship, previous performance and company responsibility. The results of your investigation of Morris Pumps for dredging or sand and gravel plant service are sure to prove highly satisfactory. Morris, the originator and first American manufacturer of centrifugal pumps, has an unmatched experience of almost 70 years covering every type of pumping service. The present-day design of Morris Pumps reflects this experience through many special features that have proven to promote exceptionally high efficiency and durability. Morris Pump performance has won the hearty commendation of plant officials all over the country because of the thoroughly dependable and trouble-free operation which uniformly characterizes each Morris installation. Finally, the unwavering policy of standing squarely back of each Morris Pump, which has been faithfully followed throughout the long history of the Morris organization, assures fair dealing in every respect.

You will be safe in specifying Morris Pumps for every abrasive-handling and general service. Send the coupon today for catalogues describing Morris pump designs for services in which you are interested.



MORRIS

CENTRIFUGAL PUMPS

MORRIS MACHINE WORKS, Baldwinsville, N. Y.
Please send copy of catalogue describing Morris Pumps for the following service:.....

Name

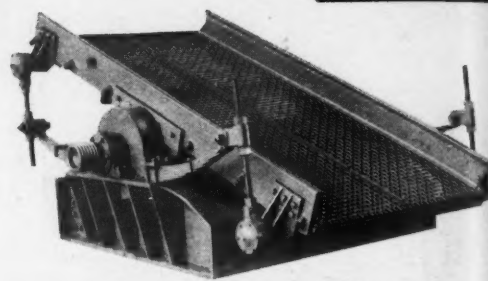
Position

Address

R.P. 5-34

HURON

HEAVY DUTY



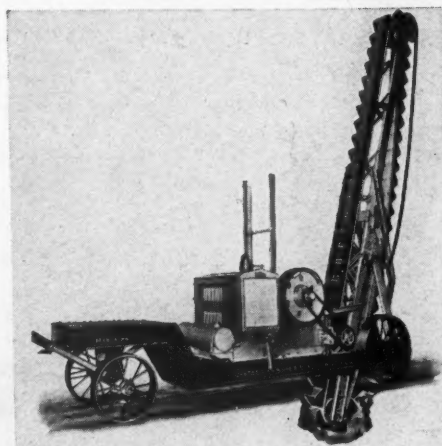
SCREENS

These screens give the operator the output and efficiency and economy made possible by such advantages as: Sturdy design, Rigid construction, Continuous operation, SKF "Brute Bearings", High capacity, Accurate screening, Positive action, Quick method of changing cloth, Deck slope adjustment, Long life, Low maintenance cost, etc. There is a HURON Screen to profitably meet your requirements. Write for bulletin.

HURON INDUSTRIES, INC.

ALPENA, MICH.

HURON



Gruendler Road-side plants are becoming very profitable with many quarry owners. Here is a Gruendler portable well-balanced, roller-bearing Jaw Crusher and power unit with folding elevator. We furnish shaker, vibrating or revolving screens and steel jack leg bins wherever desired, crushing 3½" to 4" base rock down to as fine as ½" and under. This and many other reasons is why road-side plants are getting the business.

Plants manufactured in capacity of 100 to 1,000 tons daily, portable or semi-portable type.

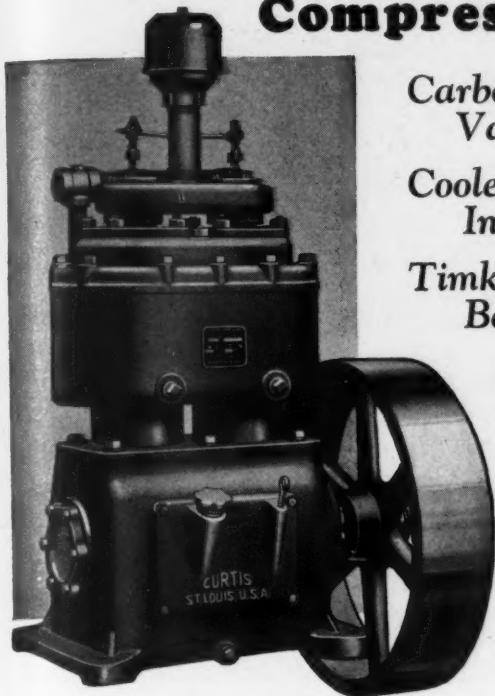
Gruendler Crusher & Pulverizer Co.

Dept. R. P.

2915 N. Market St.

St. Louis, Mo.

Greater Efficiency Increased Capacity of **CURTIS Model c** Compressor



Carbon-Free
Valves

Cooled Air
Intake

Timken
Bearings

Centro-
Ring
Oiling

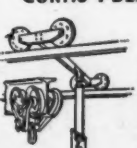
ADDITIONAL capacity with no increase in size is a feature of the new Curtis Model C Compressor. Greater efficiency is obtained with new type head equipped with large area short intake passages; over-size ports; straight line air flow; and cooled air intake. The air enters the cylinder at a low temperature. Both peak pressure and temperature of compression are decreased. Excessive head cooling is avoided, evaporation of oil from piston and cylinder walls, and precipitation of carbon is reduced.

Centro-Ring Oiling provides positive lubrication; while Timken Bearings assure reduced friction, longer life and make adjustments easy.

Because of the increased capacity, the cost of the air is relatively lower.


An illustrated folder gives full details. Write

CURTIS I-BEAM CRANES AND TROLLEYS



Large wheels, roller bearings — unusually easy-running.

CURTIS AIR HOISTS



Cost no more than chain block. Simple; laborer can handle. Abuse-proof — no repair delays. One-half to ten-ton capacity.

CURTIS PNEUMATIC MACHINERY CO.
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5518 Al Hudson Terminal, New York City

CURTIS

**COMPRESSORS—AIR HOISTS
I-BEAM CRANES AND TROLLEYS**



Extra Value in this Improved Roller Mill

Look at these features—

More efficient Air Separator, gives 50% to 150% more capacity on 200 to 325 mesh grinding. Instantly changeable from 70% 200 mesh to 99.99% 325 mesh.

BALL-BEARING Roller Journals

Parts under strain are **ELECTRIC STEEL** castings, not cast iron.

A surprisingly large number of operators are installing the Williams Improved Roller Mill because they get more for their money, extra features included in no other and above all 50% to 150% greater output on extremely fine grinding. By this method extremely fine material can be produced at a cost which permits selling in competition with coarser material. Built in six popular sizes including 50-pound-per-hour laboratory mill. Write for our printed matter.

Williams Patent Crusher & Pulverizer Co.

800 St. Louis Ave.

St. Louis, Mo.

Chicago

New York

San Francisco

37 W. Van Buren St.

15 Park Row

326 Rialto Building



Williams

OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD

PATENT CRUSHERS' GRINDERS SHREDDERS

"And It Costs 25% Less!"



Again Gardner-Denver makes air cost less and do more! Again Gardner-Denver meets the need for still lower price—still greater savings in installation costs and floor space.

The NEW Gardner-Denver Vertical Compressors are priced 25% LOWER than horizontals of the same capacity, yet they deliver every bit as much air. Installation cost is $\frac{2}{3}$ LOWER and in addition, you make a valuable saving in the amount of floor space required.

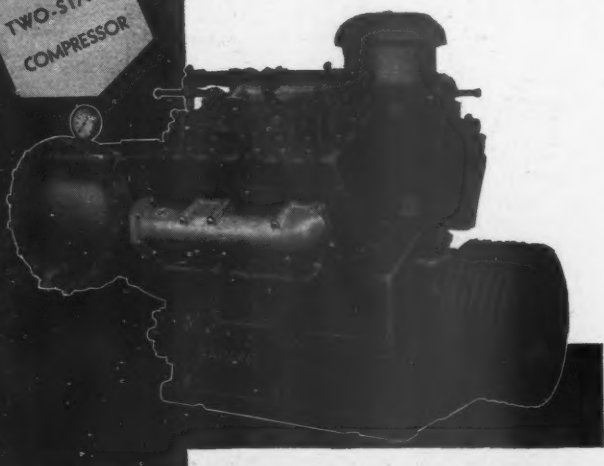
Quality? Just what you'd expect in a Gardner-Denver product—such outstanding features as cushioned inlet and discharge valves—extra large water-jackets—water-cooled intercoolers—rotary oil pump and pressure feed lubrication. No wonder! For Gardner-Denver is America's oldest and most experienced builder of vertical water-cooled compressors.

Write for free bulletin on the NEW Gardner-Denver Verticals. Get the money-saving facts!

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104 Williamson St. Quincy, Ill.



NEW "ABH"
TWO-STAGE
COMPRESSOR

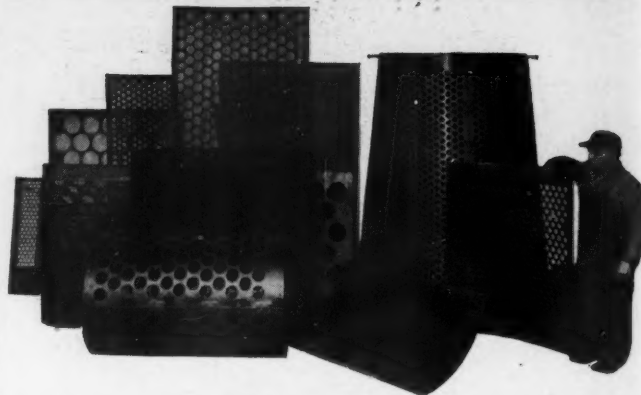


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Rock Drills, Accessories • Paving Breakers • Clay Diggers • Hoists

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MAKES AIR DO MORE AND COST LESS

SCREENS of Perforated Metal



For Sand, Gravel, Stone and Ore. Perforations of all standard types, also of unusual sizes and layouts to give large production and reduced screening costs.

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Harrington & King
PERFORATING CO.

5650 Fillmore St., Chicago, Ill. 114 Liberty St., New York, N. Y.



Feature: UNUSUALLY COMFORTABLE ROOMS. THE FINEST OF FOODS AND RATES STARTING AT \$2.50 SINGLE. \$4.00 DOUBLE

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⊗ **The HOLLENDEN**

1050 ROOMS ALL WITH BATH
RADIO IN EVERY ROOM

In Columbus it's

⊗ **The NEIL HOUSE**

650 ROOMS. ALL WITH BATH

In Akron it's

⊗ **The MAYFLOWER**

450 ROOMS. ALL WITH BATH
RADIO IN EVERY ROOM

In Miami Beach it's

⊗ **The FLEETWOOD**

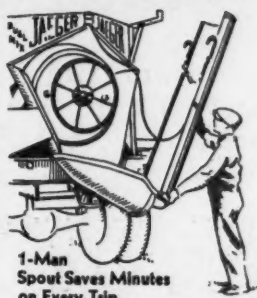
AN EXCLUSIVE WINTER RESORT HOTEL
OPERATING EUROPEAN PLAN

They Get the JOBS



..that's why JAEGER TRUCK MIXERS Outsell All Others

Because they offer every facility for the faster delivery of better concrete ("Dual-Mix" action, 1-man chute, dual controls, rapid accurate water tank and patented discharge) Jaeger Truck Mixers get most of the jobs, serve them at lowest cost, and continue to outsell all other makes. Sizes 1 to 5 cubic yards.

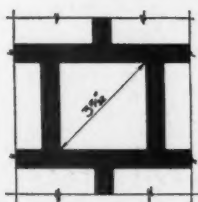


1-Man Spout Saves Minutes on Every Trip.

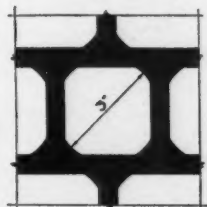
Write for details, prices.

THE JAEGER MACHINE CO. 603 Dublin Ave., Columbus, Ohio

Designed Especially for Vibrating Screens— "SQROUND" MESH



2 1/2" SQUARE MESH
STANDARD



2 1/2" SQROUND MESH
STANDARD

If you use vibrating screens, you'll be interested in "Sqround" Mesh—an exclusive Hendrick development.

A combination of square and round meshes, "Sqround" combines the good features of both. Its ingenious "square-round" design eliminates the oversize which goes through the diagonal dimension of the conventional square mesh. "Sqround" Mesh gives greater accuracy of sizing with very little reduction in open area of the screening surface.

Hendrick "Sqround" Mesh . . . Hendrick Double Corrugated Plate . . . a good combination for vibrating screens.

HENDRICK MFG. CO.

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Baltimore, Birmingham, Boston, Cincinnati, Cleveland,
Detroit, Hazleton, New York, Philadelphia, Pittsburgh

The "HAND-OUT"

Army



WHY SUPPORT SUCH A CREW ?

Unnecessary waste! . . . Why tolerate it? . . . There's a way to IMPROVE your haulage service at LESS operating cost—much less . . . Whitcomb has the evidence . . . Ask for it.

WHITCOMB LOCOMOTIVES

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STOP HAULAGE WASTE



Showing illustration of the new 12-ton Whitcomb Diesel mechanical drive locomotive that is proving such a sensation because of its simplicity, efficiency, tractability and low cost of operation.

Whitcomb Locomotives are available in the following specifications:

- Internal Combustion—Diesel and Gasoline
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- Electric drive—30 to 90 tons.
- Electric
- Storage battery—2 1/2 to 10 tons.
- Trolley—4 to 75 tons.
- Combination—8 to 75 tons.

Whitcomb sales and service everywhere. Write, phone or wire.

THE WHITCOMB LOCOMOTIVE COMPANY
Subsidiary of The Baldwin Locomotive Works
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WHITCOMB LOCOMOTIVES

"Never Lets Go"

ALLIGATOR

TRADE MARK REG. U.S. PAT. OFFICE

STEEL BELT LACING



GREAT STRENGTH



JUST A HAMMER TO APPLY IT



FLEXIBILITY

For belts of all kinds and sizes. "The most universally used belt lacing on earth." Holds belt ends in vise-like compression grip. Separable. Joint usually lasts as long as the belt. Rocker hinge pin protects lacing against internal wear. Reliable for use wherever a belt will give efficient service. In 11 sizes for belts from tape up to $\frac{5}{8}$ inch thick. Made also in MONEL Metal.



PROTECTION OF BELT ENDS



SMOOTH ON BOTH SIDES

Sole Manufacturers
FLEXIBLE STEEL LACING CO.
4684 Lexington Street Chicago, Illinois
In England at 135 Finsbury Pavement, London, E.C.2

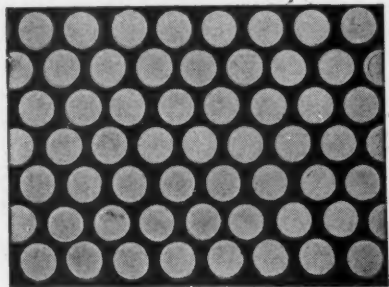
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TRADE MARK
REG. U. S. PAT. OFF.

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SCREEN PLATES



MORROW PERFORATED METAL SCREEN PLATES for sizing and preparing coal, sand, gravel, stone and other bulk materials are made by a Company specializing in screening machinery.

A complete set of punches and dies covering a wide range of sizes, in round, square, oval and diagonal slots are ready for the press, insuring prompt delivery of orders.

*Prices are right
Send for Bulletin 57.*

The Morrow Manufacturing Co.
Wellston, Ohio

GOOD ROADS CHAMPION ROCK CRUSHERS

Bucket Elevators, Conveyors,
Revolving and Vibrating Screens,
Scrubbers, Wash Boxes, Feeders, etc.

EXPERT ENGINEERING SERVICE

In addition to the old reliable Champion and Climax Crushers, a complete line of roller bearing reduction crushers of most improved design and construction—No. 1030 illustrated.



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KENNETT SQUARE, PA.

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for grinding:
Cement Materials
Phosphate Rock
Limestone
Minerals
Charcoal
Graphite
Shale
Coal



Fuller-Kinyon Transport System for Pulverized Fuel.

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BABCOCK & WILCOX

STEEL

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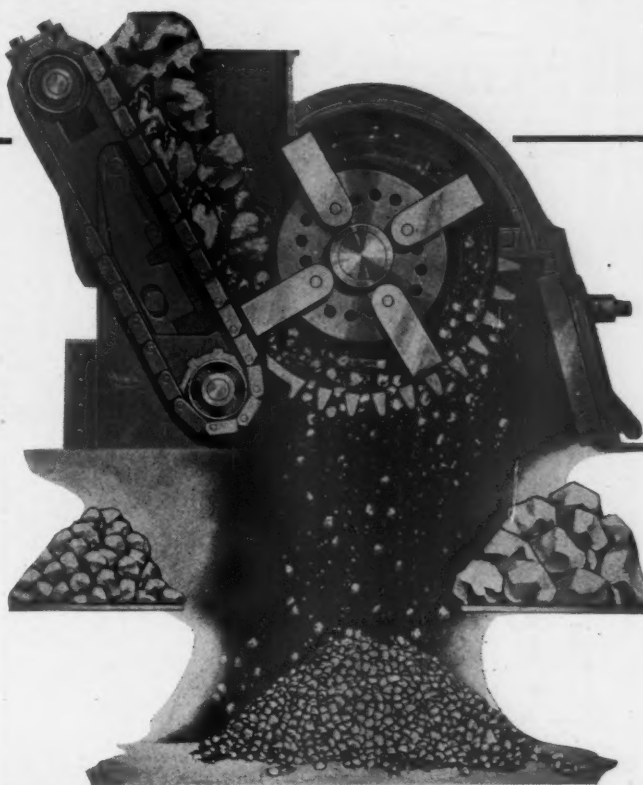
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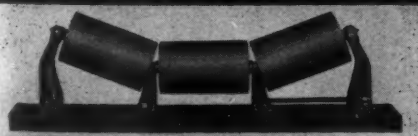
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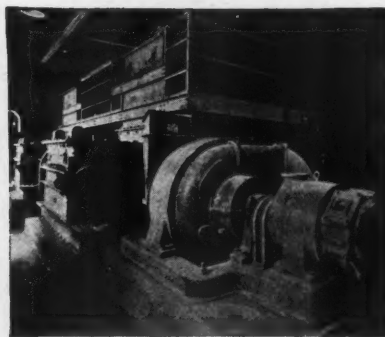
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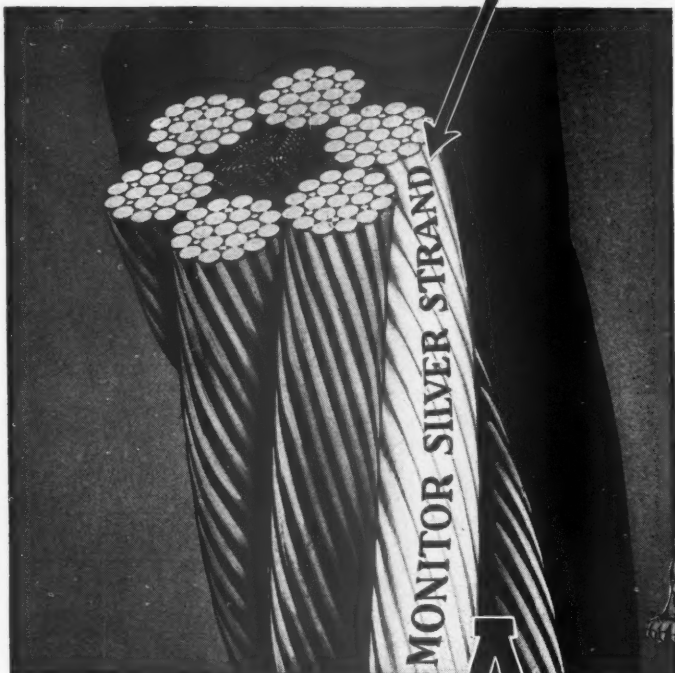
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